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Date: September 13, 2004

Docket No.: STL 9774.00

Examiner: Brian Miller

Art Unit: 2652

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

This is an appeal from an Office Action dated March 12, 2004 in which claims 1-10, 12-14 and 21-25 were finally rejected.

Seagate Technology LLC, a corporation organized under the laws of the state of Delaware, and having offices at 920 Disc Drive, Scotts Valley, California, has acquired the entire right, title and interest in and to the invention, the application, and any and all patents to be obtained thereof, as set forth in the Assignment filed with the patent application and recorded on Reel 012138, frame 0713.

There are no known related appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

STATUS OF THE CLAIMS

I. Total number of claims in the application.

Claims in the application are: 1-26

II. Status of all the claims.

A.	Claims cancelled:	15-20
B.	Claims withdrawn but not cancelled:	10-11, 26
C.	Claims pending:	1-9, 12-14 and 21-25
D.	Claims allowed:	None
E.	Claims rejected:	1-9, 12-14 and 21-25

III. Claims on appeal

The claims on appeal are: 1-9, 12-14 and 21-25

STATUS OF AMENDMENTS

On May 12 and June 10, 2004, Applicant's filed an amendment after the final rejection. Both aforementioned amendments were acted upon and entered as indicated in the Advisory Action (paper no. 14) mailed on May 27, 2004 and the Advisory Action (paper no. 16) mailed on June 24, 2004.

SUMMARY OF THE CLAIMED SUBJECT MATTER¹

Claim 1 recites a reduced lubricant accumulating slider (See FIG. 14; see also page 8, lines 30-31), the slider comprising a first air bearing surface (1110 in FIG. 14; see also page 9, line 2), a second air bearing surface (1120 in FIG. 11, see also page 9, lines 2-3), a center portion (1130 in FIG. 14; see also page 9, lines 5, and 7-8) located at least partially between the first air bearing surface and the second air bearing surface, a first streamline control element (1450 in FIG. 14; see also page 9, lines 1, 4, 10, and

¹ In paper no. 11, Applicants elected claims 1-9, 12-14 and 21-25 directed to FIGS. 14-16. Therefore, Applicants has restricted identification of claim elements to FIGS. 14-16 and associated description. Some reference numerals not shown in FIGS. 14-16 but disclosed in the description for FIGS. 14-16 will be identified as shown in other figures for ease of reference.

12) located adjacent to a trailing edge (See FIG. 14) at least partially between the first air bearing surface and the center portion, and a second streamline control element (1460 in FIG. 14; see also page 9, lines 1, 7, 10, and 12) located adjacent to the trailing edge at least partially between the second air bearing surface and the center portion, wherein the first streamline control element second streamline control element function to reduce lubricant accumulation. (See FIGS. 6 and 7, page 7, lines 24-29; FIGS. 9 and 10, page 8, lines 15-20; FIGS. 15 and 16, page 9, lines 9-17).

Claim 12, a means-plus-function claim as permitted by 35 U.S.C. 112, sixth paragraph, recites a reduced lubricant accumulating slider (See FIG. 14; also see page 8, lines 30-31) of the type having upstream and down stream portions (See FIG. 14) with airflow directed from the upstream portion toward the downstream portion comprising streamline control means (See 1450, 1460, 1470, 1480 in FIG. 14; see also page 9, lines 1-2, 4, 7, 9-31) located proximate to the downstream portion of the slider for limiting stagnation (at least one of 1450, 1460, 1470, 1480 in FIG. 14; see also page 9, lines 1-2, 4, 7, 9-31) and flow reversal (at least one of 1450, 1460, 1470, 1480 in FIG. 14; see also page 9, lines 1-2, 4, 7, 9-31).

Claim 21 recites a reduced lubricant accumulating slider (See FIG. 14; also see page 8, lines 30-31) of the type having a leading edge (See FIG. 14) and a trailing edge (See FIG. 14), of the type used in a disk drive (100 in FIG. 1; see also page 4, line 30; page 5, lines 1-30), the slider comprising first (1110 in FIG. 14; see also page 9, line 2) and second (1120 in FIG. 11, see also page 9, lines 2-3) oppositely disposed air bearing surfaces, a lowered area (1105 in FIG. 14; see also page 10, lines 13-14) between the first air bearing surface and the second air bearing surface, a center air bearing surface (1130 in FIG. 14; see also page 9, lines 5, and 7-8) arranged and configured with a portion (See FIG. 14) extending between the first air bearing surface and the second air bearing surface, a first streamline control element (1450 in FIG. 14; see also page 9, lines 1, 4, 10, and 12) having a first portion (1452 in FIG. 14; see also page

9, lines 4-5) located proximate to a trailing edge (See FIG. 14) between the first air bearing surface and the center air bearing surface, and a second portion (1454 in FIG. 14; see also page 9, lines 5-6) located in the lower area, and a second streamline control element (1460 in FIG. 14; see also page 9, lines 1, 7, 10, and 12) having a first portion (1462 in FIG. 14; see also page 9, lines 7-8) located proximate to the trailing edge between the second air bearing surface and the center air bearing surface, and a second portion (1464 in FIG. 14; see also page 9, lines 8-9) located in the lowered area, wherein the first streamline control element and the second streamline control element function to reduce lubricant accumulation. (See FIGS. 6 and 7, page 7, lines 24-29; FIGS. 9 and 10, page 8, lines 15-20; FIGS. 15 and 16, page 9, lines 9-17).

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-9, 12-14, 21-25 stand rejected under 35 U.S.C. 102(b) as being anticipated by Chapin et al. (U.S. Patent No. 5,128,822).

ARGUMENT

In Section 9 of the Office Action (paper no. 12), the Examiner rejected claims 1-10², 12-14 and 21-25 under 35 U.S.C. §102(b) as being anticipated by Chapin et al. (U.S. Patent No. 5,128,822). The Examiner's rejection of these claims is appealed for the reasons described in the following discussion.

I. Rejection of Claims 1-10 and 21-25

In Section 9 of the Office Action, the Examiner rejected claims 1-10 and 21-25 (Group I) as being anticipated by Chapin et al U.S. Patent No. 5,128,822 (herein "Chapin"). Applicants respectfully seek reversal of the Examiner's decision because the Chapin reference does not disclose a "streamline control element", nor does the

² In response to the Restriction Requirement (paper no. 10) Applicant elected claims 1-9, 12-14, and 21-25, which was acknowledged in this Office Action (paper No. 12).

Chapin reference disclose a streamline control element that “function[s] to reduce lubricant accumulation” as required in independent claims 1 and 21.

A. Chapin does not disclose a “streamline control element”

In construing claims, the analysis must begin and remain centered on the claim language itself. *Interactive Gift Express, Inc. v. Compuserve, Inc.* 256 F.3d 1323, 1331, 59 USPQ2d 1401 (Fed. Cir. 2001). It is generally presumed that the words of a patent claim have the meaning that a person of ordinary skill in the relevant art would ordinarily attribute to them. *Tex. Digital Sys., Inc. v. Telegenix, Inc.*, 308 F.3d 1193, 1202, 64 USPQ2d 1812 (Fed. Cir. 2002); *Johnson Worldwide Assocs., Inc. v. Zebco Corp.*, 175 F.3d 985, 989, 50 USPQ2d 1607 (Fed. Cir. 1999). This presumption can be rebutted if: (1) the patentee has chosen to be his own lexicographer, or (2) a claim term lacks such clarity that there is “no means by which the scope of the claim may be ascertained from the language used.” *Johnson Worldwide*, 175 F.3d at 990.

If the disputed claim term “is a term with no previous meaning to those of ordinary skill in the prior art[,] [i]ts meaning, then, must be found [elsewhere] in the patent.” *J.T. Eaton & Co. v. Atl. Paste & Glue Co.*, 106 F.3d 1563, 1568, 41 USPQ2d 1641 (Fed. Cir. 1997). Typically, the specification “is the single best guide to the meaning of a disputed term.” *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582, 39 USPQ2d 1573 (Fed. Cir. 1996). Even when guidance is not provided in explicit definitional format, “the specification may define claim terms ‘by implication’ such that the meaning may be ‘found in or ascertained by a reading of the patent documents.’” *Bell Atl. Network Servs., Inc. v. Covad Communications Group, Inc.*, 262 F.3d 1258, 1268, 59 USPQ2d 1865 (Fed. Cir. 2001) (quoting *Vitronics*, 90 F.3d at 1582, 1584 n.6).

In the present invention, the Applicant has chosen the term "streamline control element", which, until now, had no previous meaning to one skilled in the art.³ In order to give full meaning to "streamline control element" it is necessary to reference the specification for the meaning of the term. The specification clearly defines "streamline control element."⁴ The broadest definition of "streamline control element" would be a feature positioned in a location susceptible to flow stagnation or flow reversal to reduce or eliminate stagnation and/or flow reversal. (See page 6, lines 12-16, and 25-28)⁵. Although each embodiment is disclosed as having independent features, they each share common characteristics. Each "streamline control element" is positioned at least partially between the center portion (230, 1130) and the first (210, 1110) and second (220, 1120) air bearing surface. (See FIGS. 5, 8, 14; Also see page 10 lines 5-10). The "streamline control element" is also positioned in a recessed area (205, 1105) and extends from the recessed area to a height less than or equal to the air bearing surface (210, 220, 1110, 1120). (See page 10, lines 10-19). Also, each "streamline control element" has a first end (552, 562, 1452, 1462) and a second end (554, 564, 1454, 1464). (See page 10, lines 27-29). Although the aforementioned sets forth the common characteristics each "streamline control feature" possess, Applicant notes that the most important factor of reducing stagnation and flow reversal is met by placing said structure in the area of potential reverse flow and stagnation. Therefore, each structure that experiences these problems would need to be analyzed for streamlines in order to determine where the streamline control element should be positioned. (See page 9, lines 24-31).

³ This statement is based on Applicant's knowledge and analysis of the art cited by the Examiner in this case.

⁴ Elected claims are restricted to a species including FIGS. 14-16. Applicants believe independent claims 1, 12, and 21 are generic to all figures and therefore believes that a proper definition of "streamline control element" includes an analysis of the description associated with FIGS. 5-10, as well as FIGS. 14-16.

⁵ On page 6, lines 12-16, Applicants identify 2 potential stagnation locations and 1 potential flow reversal location. Lines 17-24 introduce the first embodiment, and lines 25-28 describe where the streamline control element is positioned, which is the areas of previously identified potential stagnation and flow reversal.

Chapin discloses a slider having positive pressure rails 20, 22 separated by a negative pressure cavity 28. (See column 4, lines 60-63) Separating rails 20' and 22' are positioned between the positive pressure rails 20, 22 and the negative pressure cavity 28 to define channels 30, 32. (See column 4, lines 53-57) The separating rails 20', 22' have sufficient width to isolate the cavity 28 from the channels 30, 32 but not to be sufficiently wide to act as rails themselves. (See column 5, lines 17-22). It is the channels 30, 32, not the separating rails 20', 22' that have significance to the configuration disclosed by Chapin. When the slider is flying at a skewed angle, the trailing rail draws air from the adjacent channel 30, 32 to pressurize and lift the slider on the down stream side, thus reducing roll and loss of flying height over a range of skew angles for the slider. (See column 5, lines 57-60)

The isolation channels 30, 32 may be arranged in a different configuration such as the angle configuration shown in Figures 3A-3K. In this configuration, Chapin discloses "as skew of the slider increases, airflow into the channel 30 or 32 more aligned with the direction of motion will increase, while airflow into the other channel 30 or 32 decreases. The net result is that more air is available to pressurize the trailing rail [either rail 20 or 22 as the case may be], thus reducing roll." (See column 5, lines 60-66). The isolation channels 30, 32 may have different depths relative to the negative pressure cavity 28 and may have different widths so as to provide different amounts of air pressure and air volume for pressurizing the rails 20, 22. (See column 4, lines 63-68).

The separation rails 20', 22' disclosed by Chapin are not first and second "streamline control elements" for reducing or eliminating stagnation and flow reversal as required by claim 1 or 21. As noted above, Chapin discloses separating rails 20', 22' specifically and only for the purpose of defining channels 30, 32, wherein the channels 30, 32 provide a source of air to the rails 20, 22 that is separate from air in the negative pressure cavity 28.

Chapin addresses a specific problem; that of slider roll and loss of flying height over a range of skew angles and addresses these problems by providing channels of air 30, 32 having different pressure characteristics than the negative pressure cavity 28. In the very least, Chapin fails to disclose the broadest definition of streamline control element, which is a structure positioned in an area of potential reverse flow or stagnation. This is supported by the fact that the separation rails 20', 22' are used only for the purpose of defining air channels 30, 32, (air channels are used exclusively for providing air flow with a certain volume and pressure to the positive pressure rails 20, 22) and the fact that there is no other disclosure provided by Chapin relating to other functions or purposes of rails 20', 22'. Because Chapin does not contemplate the problem of reverse flow or stagnation, Chapin cannot disclose a structure positioned in an area of reverse flow or stagnation to reduce lubrication accumulation. Applicants respectfully submit that Chapin fails to disclose every limitation of claims 1, 12, 21, and the claims that depend from them. Reversal of the rejection is respectfully requested.

B. Chapin fails to disclose the limitation "function to reduce lubricant accumulation."

Chapin fails to disclose the limitation "function to reduce lubricant accumulation" in claims 1 and 21, and therefore Chapin can not anticipate claims 1 and 21.

In the Advisory Action (paper no. 14), the Examiner states "[in] response the Examiner considers [this] limitation as "intended use" recitations and does not overcome the prior art relied on because a recitation of intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. *If the prior art structure is capable of performing the intended use, then it meets the*

claim.⁶ It is considered the pending claims are absent these specific structural differences.” (emphasis added)

There is nothing intrinsically wrong with the claim drafting technique of “attempt[ing]...to define something...by what it does rather than by what it is.” *In re Swinehart*, 439 F.2d 210, 169 USPQ 226, 228 (CCPA 1971). The Court in *In re Swinehart* concluded that the following claim satisfied 35 U.S.C. 112:

“24. A new composition of matter, transparent to infra-red rays and resistant to thermal shock, the same being a solidified melt of two components present in proportion approximately eutectic, one of said components being BaF₂ and the other being CaF₂.”

Id. at 227. All parties agreed that the limitation “transparent to infra-red rays” was the point of novelty. *Id.* at 228. Although the applicants in that case pointed to the specification to show how the transparency was created, the Examiner rejected this claim for failing to satisfy 35 U.S.C. 112 because the term “transparent to infra-red rays” was merely functional. *Id.* The Court then set forth how to determine if functional language fails to meet the requirements of 35 U.S.C. 112⁷, stating that two requirements must be met:

The first is that the language used is not precise and definite enough to provide a clear-cut indication of the scope of subject matter embraced by the claim. This ground finds its basis in the second paragraph of section 112, the rationale for which was discussed by us recently in *In re Hammack*, 57 CCPA 1225, 427 F.2d 1378, 166 USPQ 204 (1970). The second is that the language is so broad that it causes the claim to have a potential scope of protection beyond that which is justified by the specification disclosure. Cf. *General Electric Co. v. Wabash Appliance Corp.*, 304 U.S. 364, 37 USPQ 466 (1938). This ground of rejection is now recognized as stemming from the

⁶ In this statement the Examiner apparently contends that the structure of Chapin performs the same function recited in claims 1 and 21. Applicants submit that Chapin does not contemplate the problem of reverse flow and stagnation and therefore could not conceive a structure or position of a structure to cure this problem. The Examiner has not provided any arguments or data to support this position.

⁷ Applicants note that claims 1 and 21 are being rejected under 35 U.S.C. 102, yet assert that the Examiners “intended use” argument in the Advisory Action is similar to a 35 U.S.C. 112 rejection, and therefore similar to the present case.

requirements of the first paragraph of 35 U.S.C. 112. See *In re Robins*, 57 CCPA 1321, 429 F.2d 452, 166 USPQ 552 (1970); *In re Borkowski*, 57 CCPA 946, 422 F.2d 904, 164 USPQ 642 (1970). Cf. *In re Halleck*, supra. The merits of the "functional" language in the claim before us must be tested in the light of these two requirements alone. *Id.* at 229.

The Court determined that the scope of the functional term "transparent to infra-red rays" was ascertainable and definite. It was argued that because the specification set forth materials that would allow varying degrees of transmitted light, the scope of the term "transparent to infra-red rays" is not definite – that the public would not be able to determine to what degree the material is transparent. *Id.* at 230. The court reasoned that the fact that the specification disclosed material allowing varying degrees of transmitted light does not make the claim indefinite since the prior art only disclosed material that was opaque. *Id.* Further, the Court determined that language used was not overbroad because it is clear from the specification that only a limited group of objects fall within the intended category. *Id.* at 229.

Similar to functional language in *In re Swinehart*, the functional language of the present invention is defined as a structure in the specification. Further, similar to *In re Swinehart*, the prior art in the present case does not contemplate curing the issues of reverse flow and stagnation, and therefore such functional language should be treated as a structural limitation, even though the specification of the present invention proposes varying structures (and position of such structures) to solve this problem. Also, similar to *In re Swinehart*, where the Court was not concerned the breadth of the claim was beyond that which is justified by the specification, claims 1 and 21 of the present invention limit the functionality of the "streamline control element" to a specific area of the slider, and the specification clearly sets forth where each structure should be positioned.

Applicants assert that the term "function to reduce lubricant accumulation" in claims 1 and 21 of the present invention meet the test set forth by the Court in *In re Swinehart*, and therefore should be considered a limitation and not merely a recitation

of “intended use.” Further, because Chapin fails to disclose a streamline control element that “function to reduce lubricant accumulation,” Chapin cannot anticipate claims 1 and 21.

Chapin fails to disclose a “streamline control element” and/or a “streamline control element” that “function to reduce lubricant accumulation” in correlation with the definition of each in the specification. Since Chapin fails to disclose each and every limitation in the specification, there can be no anticipation. The Applicants respectfully requests the reversal of the Examiners rejection.

II. Rejection of Claims 12-14

In Section 9 of the Office Action, the Examiner rejected claims 12-14 (Group II) as anticipated by Chapin et al U.S. Patent No. 5,128,822 (herein “Chapin”). The Applicants respectfully seek reversal of the Examiner’s decision because the Chapin reference does not disclose a “streamline control means located proximate to the downstream portion of the slider for limiting stagnation and flow reversal.”

Claim 12 requires, in part, a “streamline control means located proximate to the downstream portion of the slider for limiting stagnation and flow reversal.” This limitation requires a streamline control means, the structure of which is defined by the specification or any equivalents thereof. Also, claim 12 require that the streamline control means be located in a downstream portion of the slider. Therefore, Applicants asserts that claim 12 (and claims 13-14 by nature of their dependency on claim 12) is separately patentable from the claims 1-10 and 21-25, and therefore should be group separately.

Independent claim 12 is directed to a slider, which includes a “streamline control means located proximate to the downstream portion of the slider for limiting stagnation and flow reversal.” This “streamline control means” constitutes a functional claim limitation invoking 35 U.S.C. §112, sixth paragraph. Under In re

Donaldson, 29 U.S.P.Q.2d 1845 (Fed. Cir. 1994)(en banc), the Office is obliged to construe functional claim limitations in accordance with the corresponding structure disclosed in the specification. In the present application, FIGS. 5, 8 and 14 and each figures corresponding description in the specification teach structures corresponding to the above-referenced "streamline control means". The structure corresponding to "streamline control means" is positioned at least partially between the center portion (230, 1130) and the first (210, 1110) and second (220, 1120) air bearing surface. The "streamline control means" is also positioned in a recessed area (205, 1105) and extends from the recessed area to a height less than or equal to the air bearing surface (210, 220, 1110, 1120). Further, each "streamline control means" has a first end (552, 562, 1452, 1462) and a second end (554, 564, 1454, 1464) and can be linear, straight, parallel to one another, converge or even diverge. (See page 9, lines 18-23). Although the aforementioned details the common characteristics each "streamline control feature" possess, Applicants note that the most important factor of reducing stagnation and flow reversal is by placing said structure in the area of potential reverse flow and stagnation. Therefore, each structure that experiences these problems would need to be analyzed for streamlines in order to determine where the streamline control element should be positioned. (See page 9, lines 24-31).

Chapin does not contemplate the potential problems of reverse flow and stagnation. Therefore, Chapin has not disclosed the appropriate structure, or position of that structure, to reduce or eliminate reverse flow and/or stagnation. It is not enough for Chapin to disclose a "separating rail" in between the center island and the positive pressure rail. In order to anticipate claim 12, there needs to be disclosure of a structure located on a downstream portion of the slider, postioned to limit stagnation and flow reversal; Chapin does not disclose such a structure. Therefore Chapin fails to disclose claim 12 and all claims dependent on claim 12. Applicants respectfully request reversal of the Examiners rejection.

CONCLUSION

Applicants respectfully request the rejection of claims 1-9, 12-14, and 21-25 as being anticipated by Chapin be reversed because Chapin fails to disclose a "streamline control element" that "function to reduce lubricant accumulation" as recited in claims 1 and 21, and Chapin fails to disclose a "streamline control means" as set forth in claim 12. A notice to this effect is respectfully requested.

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Heidi McCarty
Heidi McCarty

CLAIMS APPENDIX

1. A reduced lubricant accumulating slider of the type having a leading edge and a trailing edge, the slider comprising:

a first air bearing surface;

a second air bearing surface;

a center portion located at least partially between the first air bearing surface and the second air bearing surface;

a first streamline control element located adjacent to a trailing edge at least partially between the first air bearing surface and the center portion;
and

a second streamline control element located adjacent to the trailing edge at least partially between the second air bearing surface and the center portion;

wherein the first streamline control element and the second streamline control element function to reduce lubricant accumulation.

2. The reduced lubricant accumulating slider of claim 1, wherein the center portion comprises a center air bearing surface.

3. The reduced lubricant accumulating slider of claim 1, further comprising a third streamline control element in contact with the first air bearing surface and a fourth streamline control element in contact with the second air bearing surface.

4. The reduced lubricant accumulating slider of claim 1, further comprising a recessed area between the first air bearing surface and the second air bearing surface.

5. The reduced lubricant accumulating slider of claim 4, wherein each of the streamline control elements comprises a portion that is raised above a surface of the recessed area, the portion having a height relative to the recessed area that is less than or equal in height to the first and second air bearing surfaces.

6. The reduced lubricant accumulating slider of claim 1, further comprising a third air bearing surface, wherein the first air bearing surface and the second air bearing surface are bridged by the third air bearing surface.

7. The reduced lubricant accumulating slider of claim 6, wherein the third air bearing surface and the center air bearing surface are positioned at opposite ends of the slider, the center portion being positioned beyond ends of the first and second air bearing surfaces that are opposite to the third air bearing surface.

8. The reduced lubricant accumulating slider of claim 6, wherein the first and second streamline control elements each have a first end that is positioned in relation to the center portion and a second end that extends beyond the center air bearing surface towards the third air bearing surface.

9. The reduced lubricant accumulating slider of claim 8, wherein the first ends of the first and second control elements each conform to a shape of the center portion.

10-11. Withdrawn

12. A reduced lubricant accumulating slider of the type having upstream and downstream portions with airflow directed from the upstream portion toward the downstream portion comprising streamline control means located proximate to the downstream portion of the slider for limiting stagnation and flow reversal.

13. The reduced lubricant accumulating slider of claim 12, further comprising:
first air bearing means for providing lift to the slider at operational velocity;
second air bearing means for providing lift to the slider at operational velocity; and
center transducer means for housing a transducer.

14. The reduced lubricant accumulating slider of claim 13, wherein the streamline control means comprises a first streamline control element located in a recessed area defined in part by the first air bearing means and the center transducer means and a second streamline control element located in a recessed area defined in part by the second air bearing means and the center transducer means.

15-20. Canceled

21. A reduced lubricant accumulating slider of the type having a leading edge and a trailing edge, of the type used in a disk drive, the slider comprising:

first and second oppositely disposed air bearing surfaces;

a lowered area between the first air bearing surface and the second air bearing surface;

a center air bearing surface arranged and configured with a portion extending between the first air bearing surface and the second air bearing surface;

a first streamline control element having a first portion located proximate to a trailing edge between the first air bearing surface and the center air bearing surface, and a second portion located in the lower area; and

a second streamline control element having a first portion located proximate to the trailing edge between the second air bearing surface and the center air bearing surface, and a second portion located in the lowered area, wherein the first streamline control element and the second streamline control element function to reduce lubricant accumulation.

22. The reduced lubricant accumulating slider of claim 21, further comprising a third streamline control element cooperatively connected to the first air bearing surface and a fourth streamline control element cooperatively connected to the second air bearing surface.

23. The reduced lubricant accumulating slider of claim 21, wherein the first and second streamline control elements are raised above a mean plane generally defined by a surface of the lowered are and are less than or equal in height to the first and second air bearing surfaces.

24. The reduced lubricant accumulating slider of claim 22, wherein the third and fourth streamline control elements are raised above a mean plane generally defined by a surface of the lowered are and are less than or equal in height to the first and second air bearing surfaces.

25. The reduced lubricant accumulating slider of claim 21, further comprising a third air bearing surface, wherein the first air bearing surface and the second air bearing surface are connected at an end of the first and second air bearing surfaces by the third air bearing surface.

26. Withdrawn

LISTING OF AUTHORITIES RELIED ON

(a copy of each is provided)

Bell Atl. Network Servs., Inc. v. Covad Communications Group, Inc., 262 F.3d 1258, 1268 [59 USPQ2d 1865] (Fed. Cir. 2001)

In re Swinehart, 439 F.2d 210, 169 USPQ 226, 228 (CCPA 1971)

Interactive Gift Express, Inc. v. CompuServe, Inc. 256 F.3d 1323, 1331 [59 USPQ2d 1401] (Fed. Cir. 2001)

Johnson Worldwide Assocs., Inc. v. Zebco Corp., 175 F.3d 985, 989 [50 USPQ2d 1607] (Fed. Cir. 1999)

J.T. Eaton & Co. v. Atl. Paste & Glue Co., 106 F.3d 1563, 1568 [41 USPQ2d 1641] (Fed. Cir. 1997)

Vitronics Corp. v. Conceptoronic, Inc., 90 F.3d 1576, 1582 [39 USPQ2d 1573] (Fed. Cir. 1996)

Tex. Digital Sys., Inc. v. Telegenix, Inc., 308 F.3d 1193, 1202 [64 USPQ2d 1812] (Fed. Cir. 2002)

FULL TEXT OF CASES (USPQ2D)

All Other Cases

Bell Atlantic Network Services Inc. v. Covad Communications Group Inc., 59 USPQ2d 1865 (CA FC 2001)

Bell Atlantic Network Services Inc. v. Covad Communications Group Inc., 59 USPQ2d 1865 (CA FC 2001)

59 USPQ2D 1865

Bell Atlantic Network Services Inc. v. Covad Communications Group Inc.

U.S. Court of Appeals Federal Circuit

No. 00-1475

Decided August 17, 2001

Headnotes

PATENTS

[1] Patent construction — Specification and drawings —Defining terms (§125.1103)

Limitations from specification may not be read into claims, but written description can provide guidance as to meaning of claims, thereby dictating manner in which claims are to be construed, even if such guidance is not provided in explicit definitional format; thus, if patentee uses claim term throughout entire patent specification in manner consistent with only single meaning, patentee has defined that term "by implication."

[2] Patent construction — Specification and drawings —Defining terms (§125.1103)

Patent construction — Claims — Broad or narrow (§125.1303)

Transceiver of claimed data transmission systems for providing digital subscriber line services with variable rates and modes is limited to three modes of operation described in patent's detailed description of preferred embodiments, namely, "conventional," "bi-directional," and "reversible," and invention therefore does not encompass additional "modes" created by changing rate of data transfer within these broad categories, since patentees have defined term "mode" by implication through term's consistent use throughout patent's specification, and since, given this definition, claims are not entitled to any broader scope.

[3] Patent construction — Claims — Broad or narrow (§125.1303)**Patent construction — Claims — Defining terms (§125.1305)**

Data “channels,” in claims for data transmission systems for providing digital subscriber line services with variable rates and modes, are limited to unidirectional communications, even though specification and prosecution history refer to “channels” as providing bi-directional communications in some instances, since claim language supports finding that “channels” are intended to encompass only one-way communications, since written description defines “channels” in question as those that support one-way communication, and since, wherever specification discusses first and second channels referenced in claims at issue, it is clear that communication is unidirectional.

[4] Patent construction — Specification and drawings — Defining terms (§125.1103)**Patent construction — Claims — Broad or narrow (§125.1303)**

First and second data “channels,” in claims for data transmission systems for providing digital subscriber line services with variable rates and modes, must be separated by frequency, even though ordinary meaning of “channels” is not limited to communication paths separated by frequency, since specification defines first and second channels, by implication, as amounts of bandwidth, and thus, as communication paths separated by frequency, and since prosecution history demonstrates that “channels” of present invention are defined by amount of bandwidth.

JUDICIAL PRACTICE AND PROCEDURE**[5] Jurisdiction — Court of Appeals for the Federal Circuit (§405.03)**

Prevailing patent infringement defendants are not required to take cross-appeal in order to present argument for claim construction more favorable to their case than construction adopted by federal district court on summary judgment, since defendants' proposed construction would merely lead to affirmance of judgment below.

PATENTS**[6] Patent construction — Claims — Broad or narrow (§125.1303)****Patent construction — Claims — Defining terms (§125.1305)**

“Selectively changing” limitation, in claims for data transmission systems for providing

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digital subscriber line services with variable rates and modes, does not require that change in data transmission rates must occur during communication session, since varied use of limitation throughout specification clearly indicates that patent contemplates possibility of selectively changing transmission mode or rate at times other than during communication session, and since specification therefore does not define limitation, either expressly or by implication, as change made only during communication session.

[7] Infringement — Doctrine of equivalents — In general (§120.0701)

“All elements rule” precludes finding that defendants' accused digital subscriber line systems infringe patent in suit under doctrine of equivalents, since such finding, under plaintiff's infringement theory, would entirely vitiate at least two limitations contained in claims at issue.

Particular Patents

Particular patents — Electrical — DSL services

5,812,786, Seazholtz, Sims, and Sistanizadeh, variable rate and variable mode transmission system, summary judgment of non-infringement affirmed.

Case History and Disposition

Appeal from the U.S. District Court for the Eastern District of Virginia, Friedman, J.

Action by Bell Atlantic Network Services Inc. against Covad Communications Group Inc., DIECA Communications Inc. d/b/a Covad Communications Co., and Covad Communications Co. Inc. for patent infringement. Plaintiff appeals from grant of summary judgment for defendants. Affirmed.

Attorneys:

Richard G. Taranto, of Farr & Taranto, Washington, D.C.; George C. Lombardi and James F. Hurst, of Winston & Strawn, Chicago, Ill.; Adam T. Bernstein, of Verizon Communications, New York, N.Y.; John Thorne, of Verizon Services Inc., Arlington, Va., for plaintiff-appellant.

Ruffin B. Cordell, Michael J. McKeon, and Lauren A. Degnan, of Fish & Richardson, Washington, for defendants-appellees.

Judge:

Before Lourie, circuit judge, Plager, senior circuit judge, and Gajarsa, circuit judge.

Opinion Text

Opinion By:

Gajarsa, J.

Bell Atlantic Network Services, Inc. (“Bell Atlantic”) is the owner of United States Patent No. 5,812,786 (“the '786 patent”), which concerns certain data transmission services, particularly certain digital subscriber line (“DSL”) services.¹ In 1999, Bell Atlantic brought this patent infringement action against Covad Communications Company, Inc., DIECA Communications, Inc., and Covad Communications Group, Inc. (collectively “Covad”), alleging that certain DSL services offered by Covad infringe the '786 patent. On April 4, 2000, the United States District Court for the Eastern District of Virginia (“district court”) determined that certain limitations required by claims 1 and 21 of the '786 patent are not present in Covad's DSL systems either literally or under the doctrine of equivalents, and granted Covad's motion for summary judgment of noninfringement. *Bell Atlantic Network Servs. v. Covad Communications Group, Inc.*, No. 2:99cv712, slip. op. at 28 (E.D. Va. Apr. 4, 2000). Bell Atlantic appeals that judgment.

For the reasons discussed below, we affirm.

I. BACKGROUND

A. Introduction

DSL technology is a relatively new data transfer technology that can turn a single pair of copper telephone wires ("a copper pair") into a high-speed, multi-channel, data delivery system. A basic DSL system consists of two high-speed modems located at each end of a conventional telephone line— one at the telephone company's end, and one at the customer's end. This technology allows customers to gain high-speed access to large sources of data, including the internet, without the need for expensive additional wiring.

Prior to the advent of DSL technology, copper telephone wiring transmitted simple voice data at frequencies below four kilohertz (4 kHz). The transmission of this common residential telephone service is known as "POTS" ("Plain Old Telephone Service"). It has been known for some time that additional communications streams can be carried on the same wire with POTS through a technique

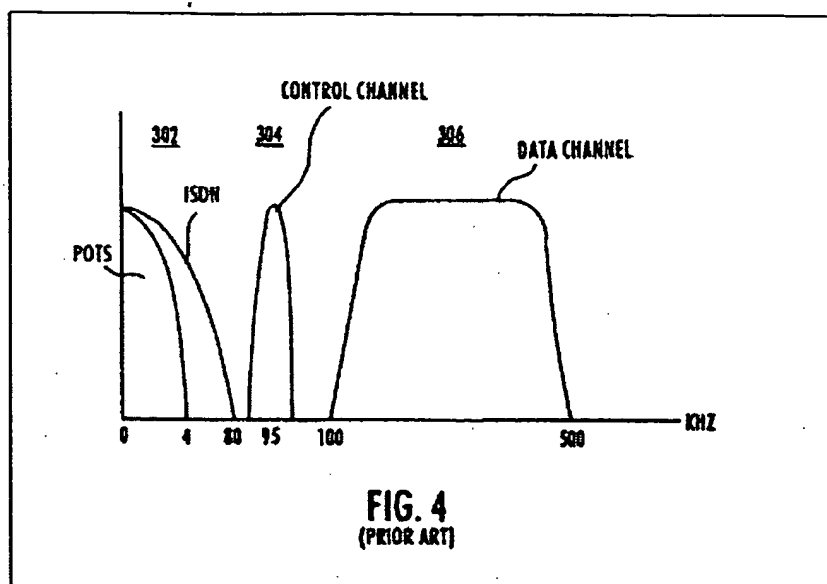
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called "frequency division multiplexing." Frequency division multiplexing is a scheme in which numerous signals are combined for transmission on a single communications line by assigning each signal a different frequency. Until recently, much of the available range of frequencies, or "bandwidth," on twisted-pair copper telephone wiring remained unused. DSL technology enables high-speed transmissions over common copper telephone wiring by exploiting the unused, higher frequencies over twisted-pair wires.

In order to take advantage of the higher frequencies, DSL technology employs high-speed modems, or transceivers, to modulate and demodulate the high-frequency data. The transceivers allow the low frequencies to be used for traditional POTS communication, while simultaneously using the higher frequencies for high-speed digital communications. A transceiver must be employed at each end of the "subscriber loop"— the customer's end and the telephone company's switching office.

Currently, there are two major types of DSL technology. Symmetric or single-line digital subscriber line ("SDSL") technology uses a range of frequencies as a single two-way channel, and transmits and receives data on this channel at the same rate. Asymmetric digital subscriber line ("ADSL") technology allocates different amounts of bandwidth based on the needs of the customer. SDSL technology may be more suitable for videoconferencing applications, because equal upstream and downstream data transmission rates are preferable. However, ADSL technology may be more suitable for video-on-demand services and for customers who download more data in the "downstream" direction than they upload in the "upstream" direction. Traditionally, ADSL systems have allocated more bandwidth for downstream communication than for upstream communication. Indeed, prior art ADSL systems allocate only a small amount of bandwidth (approximately 15 kHz) to the upstream channel, also referred to as the "control" channel.

Figure 4 of the '786 patent specification illustrates how conventional ADSL systems have divided common telephone lines into different channels using frequency division multiplexing:



The diagram illustrates that in prior art ADSL systems, POTS service uses only 4 kHz, the control channel uses about 15 kHz, and the downstream data channel uses most of the remaining bandwidth.

B. The '786 Patent Claims

The invention disclosed by the '786 patent concerns data transmission systems that can be used to provide DSL services with variable rates and modes without replacing the underlying hardware and equipment. The written description of the '786 patent notes that prior art ADSL systems were "not well suited for other services in which the nature and amount of data and control signal transfer is substantially different and changes frequently." '786 patent, col. 2, ll. 26-28. The specification observes that "the two-way control channel may be unacceptably slow for services such as interactive multi-media, distance learning, or accessing a server in a remote local area network (LAN) over a POTS line using a single copper pair. One or more of these services may require a bi-directional control channel of up to, for example, 384 kbps [kilobits per second] in order to allow substantially real-time communications so that a subscriber is not waiting for information to be transmitted." *Id.* at col. 2, ll. 29-36.

Thus, the invention disclosed by the '786 patent adds capabilities to current DSL technology by providing an ADSL system with "adjustable variable rate" functionality ("ADSL/AVR"). The '786 patent notes in the Summary of the Invention that "such a network has the advantages of conventional ADSLs, while allowing the data rate of the reverse control signaling channel to be controllably increased so as to have a higher rate transmission than ADSL in a bi-directional

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mode." *Id.* at col. 3, ll. 15-19. In other words, the ADSL system described by the '786 patent allows customers to "access any file server, download files, store information, and perform any other functions permitted in the optimum mode and at the optimum rate for that function." *Id.* at col. 15, ll. 7-9.

Claims 1 and 21 are the two independent claims at issue in this appeal. The claims read as follows:

1. A transmission system for variably transmitting information data in a *plurality of different modes* over a network, said transmission system comprising:
 - a first transceiver, connected to a first end of a subscriber loop, for *selectively operating* in one of said *plurality of different modes*, said first transceiver transmitting or receiving signals, at a first

transmission rate, on a *first channel*, and transmitting or receiving signals, at a second transmission rate, on a *second channel*, in each of said *plurality of different modes*;

a second transceiver, connected to said first transceiver via said subscriber loop, for *selectively operating* in one of said *plurality of different modes*, said second transceiver transmitting or receiving said *first channel* signals at said first transmission rate on said *first channel* and transmitting or receiving said *second channel* signals at said second transmission rate on said *second channel*; and

a controller connected to said first transceiver for *selectively changing* said first and second transmission rates.

21. An ADSL/AVR transmission system for variably transmitting information data over a plurality of channels, comprising:

a first *ADSL/AVR transceiver* for transmitting or receiving signals at a first transmission rate on a *first channel*, and transmitting or receiving signals at a second transmission rate on a *second channel*;

a second *ADSL/AVR transceiver* for transmitting or receiving signals at said first transmission rate on said *first channel* and transmitting or receiving said *second channel* signals at said second transmission rate on said *second channel*; and

a subscriber loop for connecting said first and second *ADSL/AVR transceivers* together; wherein each of said first and second *ADSL/AVR transceivers* includes a controller for *selectively changing* the transmission rates on said *first and second channels*. *Id.* at col. 17, ll. 5-23; col. 19, ll. 27-44 (emphasis added).

C. The Accused Covad DSL System

Covad provides its customers with both ADSL and SDSL services. Covad also uses DSL transceivers, called “linecards,” at both ends of the subscriber loop. In Covad's ADSL linecard transceivers, the allocation of bandwidth between the upstream and downstream channels is fixed, with most of the frequency allocated to the downstream channel. Because the bandwidth allocation is fixed, Covad's ADSL linecard transceivers are incapable of shifting bandwidth between the upstream and downstream channels without removing and reprogramming the linecard transceivers. In Covad's SDSL linecard transceivers, the allocation of bandwidth to the single, two-way SDSL channel is also fixed. Covad's SDSL linecard transceivers use “echo cancellation” techniques to allow two-way communication within the single SDSL frequency range.²

D. Procedural Background

On January 20, 2000, Covad filed a motion for summary judgment of noninfringement based on its proposed claim construction of three limitations contained in the '786 patent. On February 11, 2000, prior to the close of discovery, the district court conducted a hearing in which the parties discussed the technology and claims of the '786 patent. On February 18, 2000, the district court informed the parties that it would grant Covad's motion for summary judgment of noninfringement. On April 4, 2000, the district court issued its opinion and order explaining its claim constructions,

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and granting summary judgment of noninfringement in favor of Covad.

The district court's grant of summary judgment of noninfringement was based on the construction of three limitations contained in claims 1 and 21: (1) the “plurality of different modes” limitation in claim 1 and the “ADSL/AVR transceiver” limitation in claim 21; (2) the first and second “channel” limitation in both claims; and (3) the “selectively changing [the] transmission rates” limitation in both claims. '786 patent, col. 17, ll. 5-23; col. 19, ll. 27-44.

The district court construed the first limitation to require the transceiver described in both claims 1 and 21 to be:

[A] transceiver that operates by dividing available bandwidth between two channels in at least two of the following ways, (1) where the first channel is smaller than the second ("conventional ADSL" mode); (2) where the two channels are of "roughly" equal size ("bi-directional" mode); and (3) where the first channel is larger than the second ("reversible" mode). *Bell Atlantic*, No. 2:cv712, slip. op. at 14. The district court relied exclusively on the intrinsic evidence, including the claims, the written description, and the prosecution history, in arriving at its construction. It observed that, throughout the specification, the written description describes only these three possible modes. It concluded that it would "not broaden claims 1 and 21 beyond their support in the specification, as the three modes discussed in the patent specification literally occupy the field of possibilities contemplated by the '786 patent." *Id.* at 20.

The district court also relied solely on the intrinsic evidence for its construction of the first and second "channels" limitation. Based on a reading of the written description, the district court construed the first and second "channels" to mean: "An amount of bandwidth isolated for communications that may be either unidirectional or bi-directional." *Id.* at 24. Finally, it construed the "selectively changing" limitation to mean that "a change [in transmission rates] is chosen and occurs, although it need not occur during a communication session." *Id.* at 27. Based on these claim constructions, Bell Atlantic conceded that the accused Covad systems do not literally infringe. Moreover, the district court determined that Covad's SDSL transceivers do not infringe under the doctrine of equivalents because they "perform substantially different functions in a substantially different way to achieve substantially different results." *Id.* at 28. The district court reasoned that "Covad's single channel utilizes echo cancellation techniques to allow two-way communications, which differs substantially from two separate unidirectional channels." *Id.* at 27.

Bell Atlantic timely appealed to this court. We have jurisdiction pursuant to 28 U.S.C. §1295(a)(1) (1994).

II. STANDARD OF REVIEW

We review the grant of a motion for summary judgment *de novo*, drawing all reasonable inferences in favor of the non-moving party. *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 255 (1986). Summary judgment "shall be rendered forthwith if the pleadings, depositions, answers to interrogatories, and admissions on file, together with the affidavits, if any, show that there is no genuine issue as to any material fact and that the moving party is entitled to a judgment as a matter of law." Fed. R. Civ. P. 56 (c); *Newbanks v. Cent. Gulf Lines, Inc.*, 64 F. Supp. 2d 1, 4 (D. Mass. 1999).

The determination of infringement is a two-step process. First, the court construes the claims to correctly determine the scope of the claims. Second, it compares the properly construed claims to the accused device. *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1454, 46 USPQ2d 1169, 1172 (Fed. Cir. 1998) (*en banc*). Claim construction is an issue of law that we review *de novo*. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 970-71, 34 USPQ2d 1321, 1322 (Fed. Cir. 1995) (*en banc*), *aff'd*, 517 U.S. 370 [38 USPQ2d 1461] (1996); *Cybor*, 138 F.3d at 1456, 46 USPQ2d at 1172.

A determination of infringement, both literal and under the doctrine of equivalents, is a question of fact. *Instituform Techs., Inc. v. CAT Contracting, Inc.*, 161 F.3d 688, 692, 48 USPQ2d 1610, 1614 (Fed. Cir. 1998). Thus, viewing the facts and inferences in the light most favorable to Bell Atlantic, summary judgment is proper only if "no reasonable jury could return a verdict for the nonmoving party." *Anderson*, 477 U.S. at 255. The determination of infringement under the doctrine of equivalents is limited by two primary legal

doctrines: (1) prosecution history estoppel and (2) the “all elements” rule. *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 234 F.3d 558, 586, 56 USPQ2d 1865, 1886 (Fed. Cir. 2000) (*en banc*), cert. granted, 69 U.S.L.W. 3673 (U.S. June 18, 2001) (No. 00-1543). The application of these legal limitations is reviewed by this court *de novo*. *Id.*

III. DISCUSSION

A. Claim Construction

“It is well-settled that, in interpreting an asserted claim, the court should look first to the intrinsic evidence of record, *i.e.*, the patent itself, including the claims, the specification and, if in evidence, the prosecution history ... Such intrinsic evidence is the most significant source of the legally operative meaning of disputed claim language.” *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582, 39 USPQ2d 1573, 1576 (Fed. Cir. 1996).

We look first to the claim language itself to define the scope of the patented invention. *Id.* As a starting point, we give claim terms their ordinary and accustomed meaning as understood by one of ordinary skill in the art. *Hockerson-Halberstadt, Inc. v. Avia Group Int'l, Inc.*, 222 F.3d 951, 955, 55 USPQ2d 1487, 1490 (Fed. Cir. 2000). Accordingly, a technical term used in a patent is interpreted as having the meaning a person of ordinary skill in the field of the invention would understand it to mean. *Interactive Gift Express, Inc. v. Compuserve Inc.*, 2001 WL 792669, *7 (Fed. Cir. July 13, 2001).

Dictionaries and technical treatises, which are extrinsic evidence, hold a “special place” and may sometimes be considered along with the intrinsic evidence when determining the ordinary meaning of claim terms. *Vitronics*, 90 F.3d at 1584 n.6, 39 USPQ2d at 1577 n.6. Furthermore, we have previously cautioned against the use of non-scientific dictionaries “lest dictionary definitions ... be converted into technical terms of art having legal, not linguistic significance.” *Multiform Desiccants, Inc. v. Medzam, Ltd.*, 133 F.3d 1473, 1478, 45 USPQ2d 1429, 1433 (Fed. Cir. 1998).

Generally, there is a “heavy presumption” in favor of the ordinary meaning of claim language as understood by one of ordinary skill in the art. *Johnson Worldwide Assocs., Inc. v. Zebco Corp.*, 175 F.3d 985, 989, 50 USPQ2d 1607, 1610 (Fed. Cir. 1999). This presumption is overcome: (1) where the patentee has chosen to be his own lexicographer, or (2) where a claim term deprives the claim of clarity such that there is “no means by which the scope of the claim may be ascertained from the language used.” *Id.* at 990, 50 USPQ2d at 1610. In the first situation, a patentee may choose to be his own lexicographer and use terms in a manner other than their ordinary meaning. *Vitronics*, 90 F.3d at 1582, 39 USPQ2d at 1576. Therefore, the court must examine the intrinsic evidence to determine whether the patentees have given the term an unconventional meaning. *Hockerson*, 222 F.3d at 955, 55 USPQ2d at 1490. The specification acts as a dictionary “when it expressly defines terms used in the claims or when it defines terms by implication.” *Vitronics*, 90 F.3d at 1582, 39 USPQ2d at 1577. “Thus, the specification is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.” *Id.*

We have previously held that, in redefining the meaning of particular claim terms away from the ordinary meaning, the intrinsic evidence must “clearly set forth” or “clearly redefine” a claim term so as to put one reasonably skilled in the art on notice that the patentee intended to so redefine the claim term. *Elektra Instr. v. O.U.R. Scientific Int'l*, 214 F.3d 1302, 1307, 54 USPQ2d 1910, 1913 (Fed. Cir. 2000); *N. Telecom v. Samsung*, 215 F.3d 1281, 1287, 55 USPQ2d 1065, 1069 (Fed. Cir. 2000). We have also stated that the specification must exhibit an “express intent to impart a novel meaning” to claim terms. *Schering v. Amgen*, 222 F.3d 1347, 1353, 55 USPQ2d 1650, 1654 (Fed. Cir. 2000); *Optical Disc v. Del Mar Avionics*,

208 F.3d 1324, 1334, 54 USPQ2d 1289, 1295 (Fed. Cir. 2000). However, a claim term may be clearly redefined without an explicit statement of redefinition. Indeed, we have specifically held that the written description of the preferred embodiments “can provide guidance as to the meaning of the claims, thereby dictating the manner in which the claims are to be construed, even if the guidance is not provided in explicit definitional format.” *Scimed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1344, 58 USPQ2d 1059, 1065 (Fed. Cir. 2001). In other words, the specification may define claim terms “by implication”

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such that the meaning may be “found in or ascertained by a reading of the patent documents.” *Vitronics*, 90 F.3d at 1582, 1584 n.6, 39 USPQ2d at 1577, 1578 n.6.

Moreover, we must also examine the prosecution history to determine whether the patentee has relinquished a potential claim construction in an amendment to the claim or in an argument to overcome or distinguish a reference. *Southwall Techs., Inc. v. Cardinal IG, Co.*, 54 F.3d 1570, 1576, 34 USPQ2d 1673, 1676 (Fed. Cir. 1995); *Interactive Gift*, 2001 WL 792669, *6. This history contains the complete record of all the proceedings before the Patent and Trademark Office, including any express representations made by the applicant regarding the scope of the claims. *Vitronics*, 90 F.3d at 1582, 39 USPQ2d at 1577. The prosecution history is considered to determine whether or not there were any express representations made in obtaining the patent regarding the scope and meaning of the claims. *Id.*

Finally, if the meaning of the claim limitation is apparent from the intrinsic evidence alone, it is improper to rely on extrinsic evidence other than that used to ascertain the ordinary meaning of the claim limitation. *Id.* However, in the rare circumstance that the court is unable to determine the meaning of the asserted claims after assessing the intrinsic evidence, it may look to additional evidence that is extrinsic to the complete document record to help resolve any lack of clarity. *Id.* at 1584, 39 USPQ2d at 1578. This additional extrinsic evidence includes such evidence as expert testimony, articles, and inventor testimony. *Id.* This extrinsic evidence may be used only to assist in the proper understanding of the disputed limitation; it may not be used to vary, contradict, expand, or limit the claim language from how it is defined, even by implication, in the specification or file history. *Id.* at 1584-85, 39 USPQ2d at 1579.

1. The “Plurality of Different Modes” and “ADSL/AVR” Limitations

Bell Atlantic challenges the district court's claim construction of the “plurality of different modes” limitation in claim 1 and the “ADSL/AVR transceiver” limitation in claim 21. Based on the ordinary meaning of the word “mode,” Bell Atlantic argues that the phrase “plurality of different modes” simply requires “multiple operational states providing different transmission services, as distinguished by their upstream and downstream transmission rates, whether the differences are achieved by altering bandwidth or by the other familiar methods of altering transmission rates.” Bell Atlantic argues that the universe of “modes” contemplated by the '786 patent is not limited to the three modes discussed by the district court (conventional, bi-directional, and reversible). Bell Atlantic reasons that these three modes are simply “three broad categories” that may encompass other operational “modes.” Specifically, Bell Atlantic contends that the rate of data transfer (as opposed to the bandwidth) within each of the three broad categories can be changed to create additional modes.

For example, Bell Atlantic posits that a bi-directional service “offering 192 Kbps [kilobits per second] in each direction is quite different from one offering 1.1 Mbps [megabits per second].” Under the district court's construction, both services would operate in the same “mode” (bi-directional) because both services allocate the same amount of bandwidth to both the upstream and downstream directions. However, Bell Atlantic argues that the 192 Kbps bi-directional service would operate in a different

“mode” than the 1.1 Mbps bi-directional service because the rate of data transmission varies between the two services. Bell Atlantic also suggests that a transmission system may be changed from a conventional ADSL mode to a bi-directional mode by increasing the coding to allow “more bits per baud” or by “bit stuffing” without altering the relative bandwidth distribution of the upstream and downstream channels. In short, Bell Atlantic argues that “a plurality of different modes” also encompasses different methods of altering the transmission rates within the three broad categories.

It may be true that the ordinary meaning of the word “mode” supports a broader meaning than the construction ascertained by the district court. However, we must look at the intrinsic evidence to determine whether the patentee has given the term an unconventional meaning. *Hockerson*, 222 F.3d at 955, 55 USPQ2d at 1490; *Vitronics*, 90 F.3d at 1582, 39 USPQ2d at 1576. We are mindful that the patentee may act as his own lexicographer by using the specification to define terms either expressly or “by implication.” *Vitronics*, 90 F.3d at 1582,

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39 USPQ2d at 1577. Moreover, the ordinary meaning of the non-technical term “mode” is sufficiently broad and amorphous that the scope of the claim language can be reconciled only with recourse to the written description. *Comark Communications, Inc. v. Harris Corp.*, 156 F.3d 1182, 1187, 48 USPQ2d 1001, 1005 (Fed. Cir. 1998).

a. The '786 Patent Specification

At the outset, we note that the '786 patent is entitled “Variable Rate and Variable Mode Transmission System.” Consistent with the title of the patent, the patentees, throughout the specification, use the terms “rate” and “mode” to refer to separate and distinct concepts. In the summary of the invention, the specification states that it is an object of the invention to operate in:

a plurality of different *modes* and at any one of a plurality of different bit *rates* Still another object of the invention is to simply and easily vary the bit *rates* of the upstream and downstream channels, or the *modes* of the transceivers Another object is to either automatically control bit *rate* or *mode* by the CO or selectively control bit *rate* or *mode* by the subscriber. '786 patent, col. 2, ll. 49-64 (emphasis added). Later, the Summary of the Invention notes that the present invention “has the advantages of conventional ADSLs, while allowing the data *rate* of the reverse control signaling channel to be controllably increased so as to have a higher rate transmission than ADSL in a bi-directional *mode*.” *Id.* at col. 3, ll. 15-19 (emphasis added). The specification continues:

This variable *rate* / variable *mode* ADSL service will accommodate access to a wide variety of information providers In addition to variable bit *rates* for the control channel, the invention enables at least two *modes* for the ADSL transceivers, one providing bi-directional communications and the other providing asymmetrical communications. *Id.* at col. 3, ll. 36-46 (emphasis added). Thus, before we even reach the Detailed Description of the Preferred Embodiments, it is clear that the '786 patent specification (in the Summary of the Invention) refers to the terms “rate” and “mode” as two separate and distinct concepts. The term “rate” describes the data rate within a given channel, while the term “mode” differentiates between asymmetrical and bi-directional communications.

The written description of the preferred embodiments also guides our interpretation of the claim language, as claims must be read in light of the specification. *Scimed*, 242 F.3d at 1340-41, 58 USPQ2d at 1062. We are mindful of the fact that limitations from the specification may not be read into the claims. *Comark*, 156 F.3d at 1186, 48 USPQ2d at 1005. Indeed, Bell Atlantic argues that by limiting the construction of the term “mode” to the three broad categories described in the specification, the district court improperly imported the limitations of one embodiment into the claim term. We disagree.

We recognize that there is sometimes “a fine line between reading a claim in light of the specification,

and reading a limitation into the claim from the specification.” *Comark*, 156 F.3d at 1186, 48 USPQ2d at 1005. For example, relying on *Johnson Worldwide*, Bell Atlantic argues that it is impermissible to rely on the written description of a preferred embodiment to limit the claim language. In *Johnson Worldwide*, we held that the meaning of a claim term was not limited by its specific usage in the written description of a preferred embodiment. 175 F.3d at 991, 50 USPQ2d at 1611. We reasoned that the “[v]aried use of a disputed term in the written description demonstrates the breadth of the term rather than providing a limited definition.” *Id.*; see also *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1310, 51 USPQ2d 1161, 1170 (Fed. Cir. 1999) (holding that the written description of the preferred embodiments can set forth more than one definition of a claim term).

[1] However, Bell Atlantic's reading of *Johnson Worldwide* and characterization of the role of the written description is too narrow. We held in *Scimed*, 242 F.3d at 1344, 58 USPQ2d at 1065, that the written description “can provide guidance as to the meaning of the claims, thereby dictating the manner in which the claims are to be construed, even if the guidance is not provided in explicit definitional format.” *Id.* (emphasis added). Thus, when a patentee uses a claim term throughout the entire patent specification, in a manner consistent with only a single meaning, he has defined that term “by implication.” *Vitronics*, 90 F.3d at 1582, 39 USPQ2d at 1577; see also

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Hockerson, 222 F.3d at 955, 55 USPQ2d at 1490.

In this case, in addition to the Summary of the Invention, the Detailed Description of the Preferred Embodiments continues to use the terms “mode” and “rate” to refer to two separate and distinct concepts. The specification notes that the arrows used in figure seven “illustrate the reversible *mode* feature of the system and no fixed data *rate* is given due to the capability of the system to transmit at any one of a number of different transmission *rates*.” '786 patent, col. 10, ll. 64-67 (emphasis added). This passage uses the term “rate” to refer to the speed of data transmission, and uses the term “mode” to refer to the reversible mode feature. When describing the microprocessor that controls the transceivers, the specification states that “the variable transmission *rates* are controlled by a first [program] and the *mode* of the transceiver is controlled by a second [program].” '786 patent, col. 11, ll. 35-39 (emphasis added). Thus, the “mode” and “rate” of the transceiver are controlled by separate programs.

Further, the specification states that the system “operates in one of three selectable *modes*.” '786 patent, col. 12, ll. 3-4 (emphasis added). The specification describes the modes:

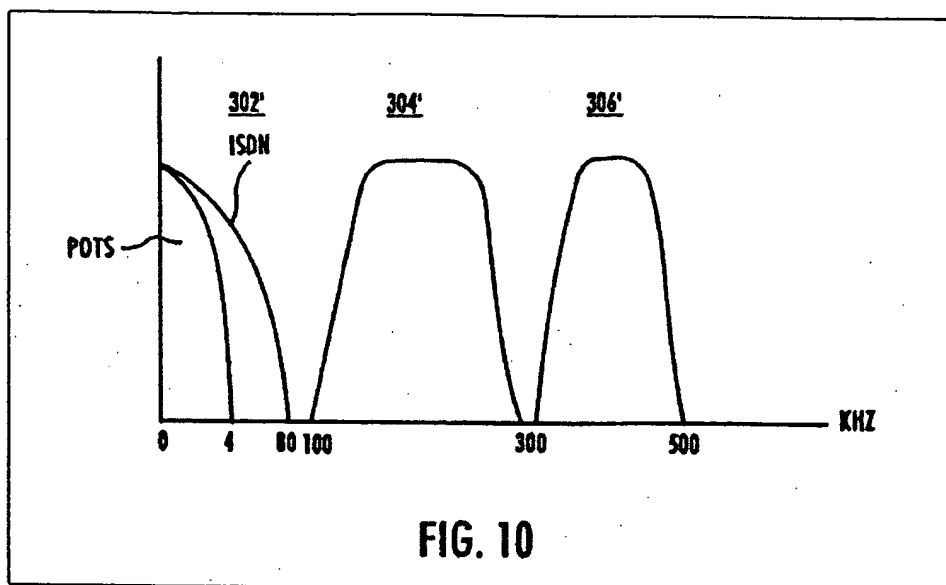
The *first mode* is conventional ADSL, which is appropriate for applications in which a subscriber wishes to view video data (using the fixed rate interface) or download a large amount of information in a predetermined downstream direction (utilizing the ethernet interface).

The *second mode* is a bi-directional transmission mode which improves upon conventional ADSL by increasing the transmission rate of the upstream channel while decreasing the transmission rate of the downstream channel. This mode is preferable for certain interactive real-time applications such as video games and distance learning, in which a 8 Kbps or 16 Kbps upstream channel is insufficient for the flow of data in the upstream direction. An example of the channelization in the bi-directional mode in which the downstream and upstream channels are roughly equivalent is illustrated in FIG. 10 by channels 302', 304' and 306'.

The *third mode* is a reversible mode in which the asymmetrical transmission of data and other information is carried out in the same manner as conventional ADSL shown in FIG. 4, but the direction of flow is selectively reversed so that the upstream direction becomes the downstream direction and vice versa. This mode is especially useful for applications in which there are non-simultaneous, non-real-time, exchanges of large amounts of information in both directions. '786

patent, col. 12, ll. 3-29 (emphasis added).

These passages refer to Figure 10 of the '786 patent, which illustrates the described distribution of channel bandwidth. Channel 306' is the downstream channel, while channel 304' is the upstream channel:



Although these passages offer the clearest description of the meaning of the term “mode” in the specification, the remainder of the written description also refers to the terms “mode” and “rate” as separate and distinct concepts:

The structure of the chips ... does not need to be changed to vary the *mode* of the transceiver or the transmission *rates* ... [The] microprocessor/controller enables the *rate* or *mode* of the ADSL/AVR to be selected in any one of a number of ways A menu [may query for] the desired *mode* and/or data *rate* The changes in *mode* and *rate* for the channel can be accomplished by the ADSL/AVR interface Once the *mode* and *rate* has been set The ADSL/AVR thus effectively functions as a variable *rate*/variable *mode* modem. Another passage refers to an “asymmetrical mode.” '786 patent, col. 13, ll. 6-7 (emphasis added). Other passages discuss the “reversible ADSL mode.” '786 patent, col. 13, ll. 51-52. Still others explain how the system may change from “bi-directional mode to ADSL mode.” '786 patent, col. 14, ll. 7-8, 44-58.

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[2] In short, there is no question that the '786 patent specification uses the terms “mode” and “rate” to refer to two different and distinct concepts. The “rate” of data flow is characterized as the transmission rate within a given channel. The “mode” is characterized by whether the relative bandwidth between the upstream and downstream channels is symmetrical or asymmetrical. Moreover, because the two terms are used separately and distinctly, different “modes” cannot be created by varying the data rate within one of the three broad categories. In other words, although a bi-directional service “offering 192 Kbps in each direction is quite different from one offering 1.1 Mbps,” nevertheless, the two services do not constitute different “modes.” Thus, given the single meaning of the term “mode” contemplated by the '786 patent specification, there are only three possible permutations by which the relative bandwidth may be characterized: (1) where the first channel is smaller than the second (conventional mode); (2) where the two channels are of roughly equal size (bi-directional mode); and (3) where the first channel is larger than the second (reversible mode).

We acknowledge that it is generally impermissible to limit claim terms by a preferred embodiment or

inferences drawn from the description of a preferred embodiment. *Johnson Worldwide*, 175 F.3d at 992, 50 USPQ2d at 1612. However, that is not the case here. We note that “[t]he usage ‘preferred’ does not of itself broaden the claims beyond their support in the specification.” *Wang Labs., Inc. v. America Online, Inc.*, 197 F.3d 1377, 1383, 53 USPQ2d 1161, 1165 (Fed. Cir. 1999). Moreover, unlike *Johnson Worldwide*, this case does not involve the “[v]aried use of a disputed term.” *Id.* at 991, 50 USPQ2d at 1611. Instead, the patentees defined the term “mode” by implication, through the term’s consistent use throughout the ’786 patent specification. *Vitronics*, 90 F.3d at 1582, 39 USPQ2d at 1577. Given this definition, the three modes described in the Detailed Description of the Preferred Embodiments describe the three possible modes of the invention, and the claims are not entitled to any broader scope. *Wang*, 197 F.3d at 1383, 53 USPQ2d at 1165.

b. Prosecution History

The prosecution history also supports limiting the transceiver to the three possible modes. During the prosecution of the ’786 patent, the examiner rejected the relevant claims as obvious over U.S. Patent No. 5,408,260 (“Arnon”). Arnon describes an ADSL transmission system and transceiver that combines ADSL data with television signals, and transmits the data at varying frequencies over coaxial cable wires. Arnon, col. 2, ll. 9-50. Arnon describes a system that combines the ADSL data signals with the cable television signal at ADSL “terminal units” within a residential building. Arnon, col. 3, ll. 23-57. The examiner initially rejected the relevant claims of the ’786 patent because:

Arnon did not expressly detail that the controller selected the mode of operation for the transceivers. Arnon however taught that the receivers and transmitters could be automatically retuned to a different frequency when a terminal unit was faulty Therefore, it would have been obvious to one of ordinary skill in the [data processing] art at the time of the claimed invention that the Arnon system comprised control means which retuned the receivers and transmitters when a terminal unit was faulty so that it could communicate via another terminal unit. Also clearly it would have been obvious that this operation would have comprised selecting the new mode of operation for transmission of data. Further since the Arnon system operated on different channels at different rates it would have been obvious to a routineer that even in normal operation the Arnon system would have used a control means to change *modes* of transfer and *speeds* of transfer. (emphasis added). Although the statements of an examiner will not necessarily limit a claim, we observe that the examiner understood that the “mode of transfer” was a separate and distinct concept than the “speed of transfer.”

Moreover, in an attempt to distinguish his invention from Arnon, the patentees responded with various statements. Importantly, the patentee argued:

In the present invention, the transmission bandwidth of channels 302, 304, and 306 are controlled for various modes using a microprocessor/controller in the ADSL/AVR unit. (Emphasis added.) It is clear from this statement that the “mode” of the present invention varies solely by changing the amount of bandwidth

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allocated between the upstream and downstream channels. In subsequent statements, the patentees described the “exemplary ADSL/AVR embodiment” that operates “in one of three” modes: conventional, bi-directional, and reversible. The patentees observed that the invention allows one to perform various functions “in the optimum *mode* and at the optimum transmission *rate* for that function.” (emphasis added). The patentees further distinguished Arnon because:

[T]he ADSL unit of Arnon’s subscriber loops appear to be conventional ADSL unit having a bandwidth distribution of the type illustrated in Applicants’ Fig. 4... . Arnon’s ADSL terminal comprises transmitters and receivers for communicating bi-directional data and control signals via the

coaxial cable *between the ADSL units and the subscriber*, in each case modulated at a frequency which is not used for television signals. This is completely different from the present invention in which the ADSL terminal selectively changes the bandwidth for both control and data channels *in the subscriber loop*.” (emphasis in original). Bell Atlantic now contends that this statement merely distinguishes the fact that Arnon's terminal units operated *within* a residential unit, while the transceivers described by the '786 patent operate *outside* the building, or “in the subscriber loop.” It is true that the emphasized language supports this distinction. However, the statement *also* states that, “the present invention ... selectively changes the bandwidth.” Thus, not only did the patentees distinguish that the invention operated in the subscriber loop, but they also emphasized that a conventional bandwidth distribution is “completely different” from the invention's system of “selectively chang[ing] the bandwidth.”

That the transceivers must operate in one of the three described modes is further supported by the language of dependent claims 9 through 12:

9. The transmission system of claim 1, wherein said plurality of different modes includes a conventional ADSL mode and a bi-directional mode.

10. The transmission system of claim 1, wherein said plurality of different modes includes a conventional ADSL mode and a reversible mode.

11. The transmission system of claim 1, wherein said plurality of different modes includes a bi-directional mode and a reversible mode.

12. The transmission system of claim 1, wherein said plurality of different modes includes a conventional ADSL mode, a bi-directional mode, and a reversible mode. '786 patent, col. 17, l. 59 to col. 18, l. 3. These four dependent claims contemplate the only four possible permutations of a “plurality of different modes.” It is true that limitations stated in dependent claims are normally not to be read into the independent claim from which they depend. *Karlin Tech., Inc. v. Surgical Dynamics, Inc.*, 177 F.3d 968, 972, 50 USPQ2d 1465, 1468 (Fed. Cir. 1999). However, our acknowledgement of dependent claims 9-12 simply further demonstrates that the '786 patent defined the term “mode” by implication to mean the relative allocation of bandwidth between the first and second channel. Such a meaning leaves only three possible modes: conventional, bi-directional, and reversible.

Bell Atlantic observes that independent claim 21 does not contain the “plurality of different modes” language contained in claim 1. Nevertheless, the district court held that the “ADSL/AVR transceiver” described in claim 21 must also operate by dividing available bandwidth between the two channels in conventional, bi-directional, and reversible modes. We agree with the district court. The second sentence of the '786 patent abstract refers to ADSL transceivers “operating at variable rates and in variable *modes* (ADSL/AVR).” (emphasis added). In the Summary of the Invention, the '786 patent specification defines the invention as “an ADSL having adjustable variable rate functionality (ADSL/AVR).” '786 patent, col. 3, l. 10-11. The '786 patent uses the terms “transceiver,” “ADSL/AVR,” and “ADSL/AVR transceiver” interchangeably throughout the written description and the prosecution history. Therefore, one of ordinary skill in the art would understand that the transceiver described in claim 1 is the same transceiver described in claim 21. Thus, at the same time the patentees defined the term “mode” by implication, they also defined the ADSL/AVR transceivers as those that operate in conventional, bi-directional, and reversible modes by allocating bandwidth

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between the first and second channels. For these reasons, the transceivers described in claims 1 and 21 are construed synonymously with the definition of “mode” set forth above.

2. The First and Second “Channel” Limitation

Bell Atlantic also challenges the district court's claim construction of the term “channel” as used in claims 1 and 21. The district court determined that the first and second channels are “an amount of

bandwidth isolated for communications that may be either unidirectional or bi-directional.” Bell Atlantic argued that channel means “a one-way path between communicating entities.” Thus, we must determine whether the '786 patent specification requires the first and second channels to: (1) be an amount of bandwidth separated in frequency, and/or (2) support both unidirectional and bi-directional communications.

a. Unidirectional Channels

The district court determined that the first and second channels described in claims 1 and 21 may support either unidirectional or bi-directional communications. The district court noted that various phrases in the specification described “two-way” channels, and reasoned that “the inventors clearly intended ‘channel’ to encompass both one-way and two-way segments of bandwidth.” However, Bell Atlantic contends that the first and second channels are instead “one way path[s].” We agree with Bell Atlantic on this aspect of the interpretation of the “channel” limitation.

[3] First, the language of the claims supports Bell Atlantic's contention that the first and second “channels” are intended to encompass only one-way communication. Claims 1 and 21 both describe a first transceiver “transmitting *or* receiving signals, at a first transmission rate, on a first channel, and transmitting *or* receiving signals, at a second transmission rate, on a second channel.” '786 patent, col. 17, ll. 9-12 (emphasis added). The use of the word “*or*” demonstrates that each transceiver either transmits *or* receives on a single channel, but not both simultaneously. Thus, the language of the claims themselves supports a construction of the first and second “channels” that excludes bi-directional or two-way communications.

Second, the written description defines the first and second channels as those that support one-way communication. Throughout the written description, the specification discusses the data channels as either “upstream” or “downstream” channels. '786 patent, col. 2, l. 60; col. 3, l. 57; col. 7, l. 48; col. 8, l. 57; col. 12, ll. 10-29. Indeed, the written description notes that in conventional ADSL systems, “channels 304 and 306 *are unidirectional*.” '786 patent, col. 9, l. 8 (emphasis added). Other passages refer to the “unidirectional” nature of the downstream or upstream channels. '786 patent, col. 9, l. 50. Thus, it is clear that the specification defines by implication the first and second channels as supporting only unidirectional communication.

Covad nevertheless contends that the specification and prosecution history also use the term “channel” to refer to bi-directional communications. Therefore, Covad reasons that the term as used in claims 1 and 21 must be construed to encompass both unidirectional and bi-directional communications. It is true that the specification refers to a “two-way” or bi-directional channel in numerous instances. '786 patent, col. 2, ll. 29-30; col. 8, ll. 24-26; col. 8, ll. 44-46; col. 13, l. 7. It is also true that during prosecution history, the patentees stated that “channel 302 provides connectivity for conventional [bi-directional] telephone services.” However, in each of these instances, it is evident that the statements regarding the bi-directional channels refer to only the prior art control channel, the signaling channel, or the POTS channel. Conversely, wherever the specification discusses the first and second (upstream and downstream) data channels referenced in the claims at issue, it is clear that the communication is unidirectional.

“In circumstances such as this, where the language of the written description is sufficient to put a reader on notice of the different uses of a term, and where those uses are further apparent from publicly-available documents referenced in the patent files, it is appropriate to depart from the normal rule of construing seemingly identical terms in the same manner. This entirely accords with the public notice function of claims.” *Pitney Bowes*, 182 F.3d at 1311, 51 USPQ2d at 1170. Thus, although the term “channel” may encompass both unidirectional and bi-directional communications, it is clear that the first and second data channel limitations in claims 1

and 21 support only unidirectional communications.

b. *Frequency Separated Channels*

The district court also held that the first and second “channels” are “an amount of bandwidth” or “bands of frequencies” or “frequency channels.” In other words, the district court determined that the channels must be separated by frequency. Bell Atlantic contends that the ordinary meaning of the term “channel” is not limited to communication paths separated by frequency. Indeed, as understood by one of ordinary skill in the art, the ordinary meaning of the term “channel” is quite broad. Within the realm of DSL technology, technical treatises refer to channels separated by frequency (“frequency division multiplexing”), channels subdivided by time (“time division multiplexing”), channels separated by “echo cancellation” techniques, and channels subdivided by various “modulation” techniques. *See, e.g.*, E. Bryan Carne, *Telecommunications Primer* 223 (Prentice Hall 2d ed. 1999); Michael Busby, *Demystifying ATM/ADSL* 37, 53-54, 205-206 (Wordware 1998).

[4] However, the '786 patent specification defines the first and second channels, by implication, as amounts of bandwidth, and thus, communication paths separated by frequency. The summary of the invention references the upstream and downstream channels. '786 patent, col. 2, l. 59; col. 3, l. 57. The written description of the preferred embodiments notes that the upstream and downstream channels are illustrated in Figure 10 as channels 304' and 306'. '786 patent, col. 12, ll. 10-21. Figure 10, discussed above, illustrates the upstream and downstream channels as channels separated by frequency.

Moreover, the specification states that “the ADSL/AVRs used *in the present invention* are a modification of, and an improvement over, conventional ADSL.” '786 patent, col. 8, ll. 15-17 (emphasis added). The specification notes that conventional transceivers use “frequency multiplexing to divide the available loop bandwidth into three channels 302, 304 and 306.” '786 patent, col. 8, ll. 20-22. In numerous other passages, the specification describes the channels in conventional ADSL systems as separated by frequency. '786 patent, col. 8, l. 20; col. 8, l. 44; col. 8, l. 60; col. 9, l. 43; col. 10, l. 46. The specification notes that the ADSL/AVR system of the present invention is similar to conventional ADSL systems. '786 patent, col. 10, ll. 60-61. Furthermore, the written description states that the channelization between the upstream and downstream channels is illustrated in Figure 10. '786 patent, col. 12, ll. 19-21. Both Figure 4 (conventional ADSL channelization) and Figure 10 (bi-directional mode channelization) show that data channels 304, 306, 304', and 306' correspond to bandwidths separated by frequency.

Moreover, the patentees stated during prosecution that “[i]n the present invention, the transmission *bandwidth of channels* 302, 304, and 306 are controlled for various modes.” (emphasis added). This statement further demonstrates that the channels used in the present invention are defined by an amount of bandwidth. Thus, the only type of channels contemplated by the '786 patent are those that occupy an amount of bandwidth—those that are separated in frequency. Nowhere does the specification discuss channels created by time-division multiplexing or echo cancellation. Indeed, in the one reference to time division multiplexing, the specification states:

A down-stream *control signal* to the subscriber (not shown in Fig. 4) is *time division multiplexed* with the 1.544 mbps video signal on the 100-500 Hz carrier. This down-stream control signal, together with the digitized information and overhead, occupies a bit rate band of about 1.6 mbps. '786 patent, col. 8, l. 66 to col. 9, l. 4 (emphasis added). The specification refrains from identifying the time-division multiplexed signal as a “channel,” instead referring to it as a “signal.”

Our construction does not limit the term “channel” through inferences drawn from the description of a preferred embodiment. *Johnson Worldwide*, 175 F.3d at 992, 50 USPQ2d at 1612. Neither does this case

involve the “[v]aried use of a disputed term.” *Id.* at 991, 50 USPQ2d at 1611. Instead, the written description “provide[s] guidance as to the meaning of the claims, thereby dictating the manner in which the claims are to be construed, even if the guidance is not provided in explicit definitional format.” *Scimed*, 242 F.3d at 1344, 58 USPQ2d at 1065. Because the patentees used the term “channel” throughout the entire patent specification, consistent with a single meaning, they defined that term “by implication.” *Vitronics*, 90 F.3d at 1582, 39 USPQ2d at 1577; *see also Hockerson*, 222 F.3d at 955,

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55 USPQ2d at 1490. Thus, in addition to being unidirectional, the first and second channels described in claims 1 and 21 also constitute an amount of bandwidth, and as such, are channels that are separated by frequency.

3. “Selectively Changing”

Covad challenges the district court's construction of the “selectively changing” limitation found in both claims 1 and 21. The district court determined that “selectively changing” the first and second transmission rates means that “a change is chosen and occurs, although it need not occur during a communication session.” However, Covad posits that this limitation requires a change “during a communication session.”

[5] As an initial matter, Bell Atlantic argues that we lack jurisdiction to decide this issue because Covad did not file a cross-appeal, and Covad's proposed claim construction would require modification of the judgment on appeal. However, the general rule is that “without taking a cross-appeal, the prevailing party may present any argument that supports the judgment in its favor” as long as the acceptance of the argument would not lead to “a reversal or modification of the judgment rather than an affirmance.” *Carnival Cruise Lines, Inc. v. United States*, 200 F.3d 1361, 1365 (Fed. Cir. 2000). Thus, where the prevailing party in a motion for summary judgment of noninfringement seeks “a claim construction more favorable to [its] case than the construction adopted by the district court on summary judgment, that would have no different result than affirmance of the [judgment].” *Genentech, Inc. v. Wellcome Found. Ltd.*, 29 F.3d 1555, 1562, 31 USPQ2d 1161, 1165 (Fed. Cir. 1994). Because Covad's proposed construction of the “selectively changing” limitation would merely lead to an affirmance of the judgment below, there is no requirement for a cross-appeal on this issue.

[6] It is true that the '786 patent specification explains that the transmission rate or mode of the ADSL/AVR may be selectively changed “during a communication session.” '786 patent, col. 13, l. 65; col. 15, ll. 4-6. Indeed, the written description describes how a user may selectively change the “mode and/or data rate.” '786 patent, col. 14, ll. 11-16. At the same time, however, the specification discusses selectively changing the mode and rate at times *other* than during a communication session:

In addition to the direct subscriber selection or control of modes during a communication session mentioned above, the selection of modes may also be made indirectly, programmed or otherwise controlled so that it is executed upon the performance of some event. '786 patent, col. 14, ll. 38-42. Elsewhere, the written description notes that “[w]hen a request for a change in modes (e.g. from ADSL to bi-directional) is received during *or prior* to a communication session, a negotiation is made.” '786 patent, col. 14, ll. 7-9 (emphasis added). The specification also recognizes that “the subscriber could ... change the mode and download the file or information *upon the occurrence of some detectable event or at a designated time.*” '786 patent, col. 14, ll. 59-62 (emphasis added). Thus, the patent clearly contemplates the possibility of selectively changing the transmission mode or rate at times *other* than during a communication session. Consequently, the specification does not define the limitation, either expressly or by implication, as a change made only *during* a communication session. The varied use of this limitation throughout the '786 patent specification “demonstrates the breadth of the term rather

than providing a limited definition.” *Johnson Worldwide*, 175 F.3d at 991, 50 USPQ2d at 1611. Covad's proposed construction would improperly import a limitation from the specification into the claim. *Comark*, 156 F.3d at 1186, 48 USPQ2d at 1005.

Instead, the significance of the “selectively changing” and “selectively operating” limitations is that the transmission mode or rate may be changed either automatically or manually without altering the transceiver hardware. The specification notes that a subscriber may “upgrade the capability of the service to higher data rates in the future using a network management system *without altering the hardware.*” '786 patent, col. 11, ll. 57-59 (emphasis added). The specification also states:

[t]he structure of the chips in the chip set does not need to be changed to vary the mode of the transceiver or the transmission rates The use of a single chip set, capable of either transmitting or receiving conventional ADSL, at both ends of the transmission loop in the ADSL/AVR system ...

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make it possible to easily and selectively implement the reversible ADSL mode. '786 patent, col. 13, ll. 46-60. Moreover, in the prosecution history, the patentees distinguished the fixed-bandwidth nature of Arnon:

[E]ven though Arnon teaches a fault induced substitution mode ... the bandwidth or transmission rates in the ADSL loops during the fault mode or during the normal modes remain unchanged. Hence, it is submitted that Arnon fails to show, teach, or suggest *selectively changing* the first and second transmission rates in the subscriber loop. (Emphasis added.)

Thus, the “selectively changing” and “selectively operating” limitations in claims 1 and 21 mean that a change is chosen or occurs without alteration of the transceiver hardware, although the change need not occur during a communication session.

B. Infringement Analysis

Bell Atlantic does not argue, under our claim construction, that Covad's accused DSL systems literally infringe the '786 patent. However, Bell Atlantic contends that Covad's accused SDSL systems, which use echo cancellation, could infringe under the doctrine of equivalents. Bell Atlantic notes that it furnished evidence establishing that the single bi-directional channel used by Covad's SDSL linecards is insubstantially different from the two unidirectional channels described in claims 1 and 21 of the '786 patent. The district court rejected this argument, holding that “Covad's SDSL transceivers perform substantially different functions in a substantially different way to achieve substantially different results.”

Bell Atlantic submitted the affidavit of Dr. Charles L. Jackson as expert testimony supporting its position. Dr. Jackson states:

One could substitute the upstream SDSL communications path [in Covad's system] for one of the channels in claim 1 and the downstream SDSL communications path for the other channel in claim 1. The overlapping paths of the SDSL connection would perform the same function as the nonoverlapping channels required by Covad's view of claim 1. They are used in the same fashion as are the channels in the claim and they result in moving information signals to and from the customer premises as would the channels in Covad's interpretation of claim 1. Bell Atlantic asserts that its expert testimony creates at least a genuine issue of material fact to prevent summary judgment.

[7] However, under the “all elements rule,” there can be no infringement under the doctrine of equivalents if even one element of a claim or its equivalent is not present in the accused device. *Pennwalt Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931, 935-36, 4 USPQ2d 1737, 1739-40 (Fed. Cir. 1987) (*en banc*),

cited in *Festo*, 234 F.3d at 587, 56 USPQ2d at 1887. Such a determination must be premised upon a proper claim construction. *Insituform*, 99 F.3d at 1109, 40 USPQ2d at 1610. Thus, if a court determines that a finding of infringement under the doctrine of equivalents “would entirely vitiate a particular claim element,” then the court should rule that there is no infringement under the doctrine of equivalents. *Festo*, 234 F.3d at 587, 56 USPQ2d at 1887 (citing *Warner-Jenkinson Co., Inc. v. Hilton Davis Chemical Co.*, 520 U.S. 17, 39 n.8, 41 USPQ2d 1865, 1875 n.8 (1997)).

In this case, Bell Atlantic's theory of infringement under the doctrine of equivalents would entirely vitiate at least two limitations contained in claims 1 and 21. The bandwidth of Covad's SDSL linecards is fixed with physical filters, and the amount of bandwidth cannot be changed once the transceivers are implemented and manufactured. Thus, Bell Atlantic's theory of equivalence would entirely vitiate the claim limitations that require the transceivers to “selectively change” or “selectively operate” the rate or mode without changing the transceiver hardware. Moreover, Covad's SDSL linecards use “echo cancellation” techniques to allow two-way communication in a single frequency range over a single channel. Again, Bell Atlantic's theory of equivalence would entirely vitiate the limitations that require two unidirectional channels, separated by frequency. Accordingly, there can be no infringement under the doctrine of equivalents.

IV. CONCLUSION

For the reasons discussed, the district court's grant of summary judgment of noninfringement in favor of Covad is

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AFFIRMED.

COSTS

Plaintiff-Appellant shall bear the costs of this appeal.

Footnotes

1 Bell Atlantic is now called Verizon Services Corporation, a wholly owned subsidiary of Verizon Communications, Inc., formerly Bell Atlantic Corporation. For purposes of consistency, we refer to the plaintiff as Bell Atlantic.

2 Echo cancellation allows a single frequency range to carry both the upstream and downstream signals. The signals overlap and are separated by the well-known technique of local echo cancellation.

- End of Case -

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(CCPA)
169 USPQ 226

Decided Apr. 1, 1971

No. 8396

U.S. Court of Customs and Patent Appeals

Headnotes

PATENTS

1. Claims - Functional - In general (§ 20.451)

"Functional" indicates nothing more than fact that attempt is being made to define something by what it does rather than by what it is; there is nothing intrinsically wrong with use of such technique in drafting patent claims.

2. Claims - Functional - In general (§ 20.451)

Court sees no merit in any proposition which would require denial of claim solely because of type of language used to define subject matter for which patent protection is sought.

3. Claims - Functional - In general (§ 20.451)

Patentability - Subject matter for patent monopoly - Function (§ 51.603)

Concern over use of functional language at "point of novelty" stems largely from fear that applicant will attempt to distinguish over reference by emphasizing property or function not mentioned in reference and thereby assert that his claimed subject matter is novel; such a concern is irrelevant and misplaced; mere recitation of newly discovered function or property, inherently possessed by things in prior art, does not cause claim drawn to those things to distinguish over prior art; additionally, where Patent Office has reason to believe that functional limitation asserted to be critical for establishing novelty in claimed subject matter may, in fact, be an inherent characteristic of prior art, it possesses authority to require applicant to prove that subject matter shown to be in prior art does not possess characteristic relied on.

4. Claims - Functional - In general (§ 20.451)

There is no support, in holdings of prior cases or in statute, for proposition that "functional" language, in and of itself, renders claim improper; moreover, there is no court decision holding that there is some other ground for objecting to claim on basis of any language, "functional" or otherwise, beyond what is already sanctioned by 35 U.S.C. 112.

5. Claims - Broad or narrow - In general (§ 20.201)

Claims - Functional - In general (§ 20.451)

Claims - Indefinite - In general (§ 20.551)

Assuming that applicant is claiming what he regards as his invention, there are in reality only two basic grounds for rejecting claim under 35 U.S.C. 112; first is that language used is not precise and definite enough to provide clear-cut indication of scope of subject matter embraced by claim; this ground finds its basis in second paragraph of section 112; second is that language is so broad that it causes claim to have a potential scope of protection beyond that which is justified by specification disclosure; this ground stems from first paragraph of section 112; merits of "functional" language in claim must be tested in light of these two requirements alone.

6. Claims - Functional - In general (§ 20.451)

"Functional" terminology may render claim quite broad; by its own literal terms, claim employing such language covers any and all embodiments which perform recited function; legitimate concern often exists as to whether scope of protection defined thereby is warranted by scope of enablement indicated and provided by description contained in specification; this is not to say, however, that every claim containing "functional" terminology is broad, since, in many cases, it is obvious that only a very limited group of objects will fall within intended category.

Particular patents-Crystalline Materials

Swinehart and Sfiligoj, Crystalline Materials, claim 24 of application allowed.

Case History and Disposition:

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Appeal from Board of Appeals of the Patent Office.

Application for patent of Carl F. Swinehart and Marko Sfiligoj, Serial No. 314,952, filed Oct. 9, 1963; Patent Office Group 165. From decision rejecting claim 24, applicants appeal. Reversed; Lane, Judge, concurring with opinion; Almond, Judge, dissenting with opinion.

Attorneys:

John P. Hazzard and James A. Lucas, Cleveland, Ohio, for appellant.

S. Wm. Cochran (Joseph F. Nakamura of counsel) for Commissioner of Patents.

Judge:

Before Rich, Almond, Baldwin, and Lane, Associate Judges, and Newman, Judge, United States Customs Court, sitting by designation.

Opinion Text

Opinion By:

Baldwin, Judge.

This appeal is from the decision of the Patent Office Board of Appeals, adhered to on reconsideration, which affirmed the rejection of claim 24 in appellants' application ¹as failing to meet the requirements of 35 U.S.C. 112. The board reversed the rejection of two other claims.

The Invention

The subject matter of the appealed claim is a composition of matter essentially made up of barium fluoride and calcium flouride in approximately eutectic proportions. The record indicates, and appellants confirm, that "[e]utectic compositions of barium fluoride and calcium fluoride are well known in the prior art." However, appellants are apparently the first to discover that when crystalline forms of these two components are melted together in eutectic proportion and then resolidified by "conventional crystal-growing techniques," there results a multi-phase crystalline body characterized by an intimate matrix of large, visible crystals, which, unlike the prior art materials, does not cleave, is resistant to thermal shock and impact and approaches maximum density for the overall composition. In addition, and allegedly unexpectedly, these crystalline bodies "are capable of transmitting collimated light," especially in the infrared wave range.

The appealed claim recites:

24. A new composition of matter, transparent to infra-red rays and resistant to thermal shock, the same being a solidified melt of two components present in proportion approximately eutectic, one of said components being BaF₂ and the other being CaF₂.

According to their brief, "[t]he exact point of novelty between appellants' claimed composition and that of the prior art is transparency." ²

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The Grounds for Rejection

The examiner rejected claim 24 "for failing to particularly point out and distinctly claim the invention as required in 35 U.S.C. 112." His asserted reasons were as follows:

Claim 24 is functional and fails to properly point out the invention. Applicants point out on page 2 of the specification, lines 24-27 that when the components are merely fused and cast as an integral body, said body is opaque. This claim in reciting "transparent to infrared rays" is thus

improperly functional. * * * It should also be noted that this claim does not require more than one phase.

The board agreed, adding:

Claim 24 stands rejected as improperly functional in that it distinguishes over the unsatisfactory material of appellants' figure 3 merely in the functional term "transparent to infrared rays." We agree with the examiner in this respect, as transparency of the claimed material cannot be treated as an inherent, characteristic property, in view of the fact that the composition of appellants' Example V (figure 3) lacks this property, yet is made of the same materials as appellants' Example I. * * * This claim is not the type covered by a proper functional limitation pursuant to 35 U.S.C. 112, since the language in question does not define a means or a step, or a distinguishing ingredient.

Opinion

It is fairly safe to conclude from the language quoted above that the examiner and the board considered the use of functional language, per se, to render the instant claim indefinite. Appellants have apparently conceded that "functionality" is ordinarily equated with indefiniteness. They argue strenuously, however, that the disputed language here does not necessarily refer to a function of the recited composition or to a desired result but rather it defines a physical property. On the record produced in the Patent Office, therefore, it would appear that the single issue before us is whether the disputed language is in fact "functional". If this issue were determinative, appellants would fail since we have no doubt that such language is "functional" at least insofar as we interpret the meaning of that term. In any event, for reasons which will become clear as this opinion progresses, we find that issue to be not only *not* determinative of whether claim 24 satisfies the requirements of 35 U.S.C. 112 but also irrelevant in the analysis leading up to that determination.

[1] We take the characterization "functional", as used by the Patent Office and argued by the parties, to indicate nothing more than the fact that an attempt is being made to define something (in this case, a composition) by what it *does* rather than by what it *is* (as evidenced by specific structure or material, for example). In our view, there is nothing intrinsically wrong with the use of such a technique in drafting patent claims. ³Indeed we have even recognized in the past the practical *necessity* for the use of functional language. See, for example, *In re Halleck*, 57 CCPA 954, 421 F.2d 911, 164 USPQ 647 (1970). We recognize that prior cases have hinted at a possible distinction in this area depending on the criticality of the particular point at which such language might appear. ⁴Our study of these cases has satisfied us,

[3] however, that any concern over the use of functional language at the so-called "point of novelty" stems largely from the fear that an applicant will attempt to distinguish over a reference disclosure by emphasizing a property or function which may not be mentioned by the reference and thereby assert that his claimed subject matter is novel. Such

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a concern is not only irrelevant, it is misplaced. In the first place, it is elementary that the mere recitation of a newly discovered function or property, inherently possessed by things in the prior art, does not cause a claim drawn to those things to distinguish over the prior art. Additionally, where the Patent Office has reason to believe that a functional limitation asserted to be critical for establishing novelty in the claimed subject matter may, in fact, be an inherent characteristic of the prior art, it possesses the authority to require the applicant to prove that the subject matter shown to be in the prior art does not possess the characteristic relied on.

[4] We are convinced that there is no support, either in the actual holdings of prior cases or in the statute, for the proposition, put forward here, that "functional" language, in and of itself, renders a claim improper. We have also found no prior decision of this or any other court which may be said to hold that there is some other ground for objecting to a claim on the basis of *any* language, "functional" or otherwise, beyond what is already sanctioned by the provisions of 35 U.S.C. 112. ⁵

[5] Assuming that an applicant is claiming what he regards as his invention, there are in reality only two basic grounds for rejecting a claim under § 112. The first is that the language used is not precise and definite enough to provide a clear-cut indication of the scope of subject matter embraced by the claim. This ground finds its basis in the second paragraph of section 112, the rationale for which was discussed by us recently in *In re Hammack*, 57 CCPA 1225, 427 F.2d 1378, 166 USPQ 204 (1970). The second is that the language is so broad that it causes the claim to have a potential scope of protection beyond that which is justified by the specification disclosure. Cf. *General Electric Co. v. Wabash Appliance Corp.*, 304 U.S. 364, 37 USPQ 466 (1938). This ground of rejection is now recognized as stemming from the requirements of the first paragraph of 35 U.S.C. 112. See *In re Robins*, 57 CCPA 1321, 429 F.2d 452, 166 USPQ 552 (1970); *In re Borkowski*, 57 CCPA 946, 422 F.2d 904, 164 USPQ 642 (1970). Cf. *In re Halleck*, *supra*. The merits of the "functional" language in the claim before us must be tested in the light of these two requirements alone.

[6] "Functional" terminology may render a claim quite broad. By its own literal terms a claim employing such language covers *any and all* embodiments which perform the recited function. Legitimate concern often properly exists, therefore, as to whether the scope of protection defined thereby is warranted by the scope of enablement indicated and provided by the description contained in the specification. This is not to say, however, that every claim containing "functional" terminology is broad. Indeed, in many cases it will be obvious that only a very limited group of objects will fall within the intended category. Such appears to be the case here, since we do not sense any concern by the Patent Office that appellants are claiming more than they are entitled to claim under the first paragraph of section 112. We need not, therefore, consider whether there are any problems with the appealed claim arising under that paragraph. It is clear that the arguments of the parties are concerned solely with whether the disputed language serves to define the subject matter for which protection is sought with the distinctness and particularity which are required by the second paragraph of section 112.

In the brief for the Patent Office, it has been asserted for the first time that

the limits of appellant's invention clearly are not fixed by the expression "transparent to infrared rays." The expression is not defined, and in fact does not appear, in appellant's written description of their invention.

The solicitor points out that, in their specification, appellants demonstrate the novel aspect of their invention by setting out three charts depicting the percentage (as a function of wavelength) of infrared radiation transmitted through a 5mm thick "window" made from a eutectic composition of the components recited in the claim. One chart indicates that a fused and cast mixture of the two components transmits "substantially zero" collimated light in the infrared range. The other two charts indicate that when the fused mixture is "grown to form a crystal ingot", windows made therefrom transmit up to approximately 80% of infrared radiation depending on the particular wavelength of the

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radiation. What those charts also appear to indicate, however, is that the conditions used in preparing the product may affect to some extent both the percentage transmission and the band of wavelength transmitted. The solicitor argues that "transparency is a matter of degree" and complains that because

- the "less favorable conditions" which produce a less effective product are not specifically disclosed in the specification

one would not know whether a product is "transparent to infrared rays", and therefore would infringe the claims, if the product transmits less infrared than is shown in Fig. 2.

Accepting the solicitor's argument as an attack on the definiteness of the disputed language in the claim before us, we must nevertheless disagree that the claim is rendered indefinite by that language. The record before us establishes that prior art compositions are substantially opaque to infrared rays. Appellants have produced a composition which is substantially transparent to such rays. Such a composition is conceded to be novel. It is true that the figures reproduced in the specification indicate that the degree of transparency varies depending on such factors as the conditions employed in producing the crystal, the thickness of the crystal and the particular wave length of the radiation transmitted. However, in all cases a *substantial* amount of infrared radiation is transmitted. We do not read appellants' disclosure as suggesting that only certain *degrees* of transparency to infrared are comprehended within the teaching there given. It follows that when appellants' claim is read in light of that disclosure the limits it purports to define are made sufficiently clear.

The decision of the board is *reversed*.

Footnotes

Footnote 1. Serial No. 314,952, filed October 9, 1963, for "Crystalline Materials."

Footnote 2. We observe that the term "transparent", as indicated by its primary dictionary definition of "having the property of transmitting light without appreciable scattering so that bodies lying beyond are entirely visible," generally is taken to refer to those light waves which are visible to the human eye. The parties here seem to agree that in the claim before us the term is used in its less common sense of being "pervious to any specified form of radiation." Clearly the most important defining characteristic of the word, which is the same in either sense, is that the light is transmitted "without appreciable scattering." Ref: Webster's Third New International Dictionary (G & C Merriam Co., 1969).

Footnote 3. We think our views herein are in accord with those of Congress as indicated by the language of the third paragraph of 35 U.S.C. 112. Note also the discussion and authorities cited on this point in *In re Fuetterer*, 50 CCPA 1453, 319 F.2d 259, 138 USPQ 217 (1963).

Footnote 4. [2] The solicitor, it appears, would also treat the question of *what* is being defined as important. He distinguishes a case relied on by appellants as "irrelevant" since the functional term there permitted dealt with novel proportions in a composition whereas here the question is "whether novelty in structure can be precisely defined in wholly functional terms." Nevertheless, we are unable to see merit in any proposition which would require the denial of a claim *solely* because of the *type* of language used to define the subject matter for which patent protection is sought. Insofar as the opinion in *In re Fisher*, 50 CCPA 1025, 307 F.2d 948, 135 USPQ 22 (1962), cited and relied on by the Patent Office here is inconsistent with the above statement, it will no longer be followed. Any doubt whether claims containing language such as that used in the Fisher case would be patentable was laid to rest last term when this court reversed the Patent Office position when the Fisher application came before us for a second time. See *In re Fisher*, 57 CCPA 1099, 427 F.2d 833, 166 USPQ 18 (1970).

Footnote 5. Compare the following language quoted from the opinion in *Locklin v. Switzer Bros., Inc.*, 125 USPQ 515, 519

(N.D. Cal., 1959), *aff'd* 299 F.2d 160, 131 USPQ 294 (9th Cir. 1961):

Plaintiffs cite a multitude of cases in support of the argument that this functional expression invalidates the claims. But, none of these cases holds that claims employing functional expressions to define the claimed invention are per se invalid. In all of the cases relied upon by Plaintiff the claims were disapproved because under the particular circumstances the use of functional expressions either left the description of the invention too vague or made the claim broader than the invention.

Concurring Opinion Text

Concur By:

Lane, Judge, concurring.

I concur in the result reached by the principal opinion. While I do not necessarily disagree with the conclusions about functionality stated therein, I find it unnecessary in this case to make such conclusions.

Taking the language of the third paragraph of section 112 as a definition of the type of "functional" expressions which have long been troublesome in patent law, I find that such expressions are those which recite "a means or step for performing a specified function without the recital of structure, material, or acts in support thereof." An example of what is meant by "a specified function" is found in the Supreme Court's opinion in *General Electric Co. v. Wabash Appliance Corp.*, 304 U.S. 364, 37 USPQ 466 (1938). In that case, offsetting and sagging of filaments in incandescent lamps had long been a problem in the art. The specification there described how to remedy those problems by regulating the size and shape of the grains of material making up the filaments. The claims contained the following expression, which was relied upon for novelty: "grains of such size and contour as to prevent substantial sagging and off-setting during a normal or commercially useful life for such a lamp." *Id.* at 368, 37 USPQ at 468. The court stated:

"A limited use of terms of effect or result, which accurately define the essential qualities of a product to one skilled in the art, may in some instances be permissible and even desirable, but a characteristic essential to novelty may not be distinguished from the old art solely by its tendency to remedy the problems in the art met by the patent.

Id. at 371, 37 USPQ at 469. The court thus held, under the patent law then in effect, that certain kinds of functional expressions were impermissible at the point of novelty, specifically, those wherein the recited function is merely the solution of a problem in the art.

It cannot be the law that all functional terms are condemned when used to distinguish a claimed invention from the prior art. If this is the law, and it is carried to its logical conclusion, many nouns and adjectives would be condemned as functional, since they define in terms of use or effect. For example, a "door" is something used to close and open a passageway; a "nail" is an object used to hold two pieces of material together; a "black" material is one incapable of reflecting visible light. It is apparent to me that if functionality at the point of novelty is ever per se a ground for rejecting claims, it is not always so.

The kind of function recited in the product claim before us-transparent to infrared rays-is a physical characteristic of the composition of matter claimed. Moreover, no one has suggested a more distinct way of defining that composition, although it has been argued that the degree of transparency might be more precisely defined. I conclude that the recitation here is not the kind of claim functionality

condemned by earlier cases but that it is a kind which is permitted.

It is true that all expressions in claims, functional or otherwise, must be definite in order to satisfy the second paragraph of 35 U.S.C. 112. I am in agreement with the

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principal opinion that the expression here in issue is reasonably definite.

Dissenting Opinion Text

Dissent By:

Almond, Judge, dissenting.

I agree with everything in the majority opinion except the conclusion that appellants' use of the phrase "transparent to infra-red rays" in claim 34 does not make the claim indefinite. The majority apparently would define "transparent" as "substantially transparent" or as transmitting "a *substantial* amount of infrared radiation." This is necessary since accepting a dictionary definition such as "transmitting light" or "opposed to opaque" would raise the question of what there is in the mere word "transparent" to distinguish the claim from the prior art compositions which appellants have characterized as being only "substantially" opaque (indicating that some light may be transmitted).

Even reading the limitation "substantially transparent" into the claim, which is of questionable propriety since a claim should be given the broadest interpretation reasonable during prosecution (see *In re Prater*, 56 CCPA 1381, 415 F.2d 1393, 162 USPQ 541 (1969), does not in my opinion make the claim definite. When does a eutectic composition stop being "substantially opaque" and become "substantially transparent"? The mere fact that there is no definite answer to this question means to me that the claim is indefinite. The second paragraph of 35 U.S.C. 112 requires that the claim point out the invention with more particularity than was done here, and this is especially significant since "the exact point of novelty between appellants' claimed composition and that of the prior art is transparency." Since no clear metes and bounds have been set forth, it appears to me that the solicitor was right in stating that:

* * * the lower limits of the claimed product are not fixed as to percent transmission and band of wavelengths transmitted, and one would not know whether a product is "transparent to infrared rays", and therefore would infringe the claims, if the product transmits less infrared than is shown in Fig. 2.

I would, therefore, affirm the decision of the board.

- End of Case -

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FULL TEXT OF CASES (USPQ2D)

All Other Cases

Interactive Gift Express Inc. v. Compuserve Inc., 59 USPQ2d 1401 (CA FC 2001)

Interactive Gift Express Inc. v. Compuserve Inc., 59 USPQ2d 1401 (CA FC 2001)

59 USPQ2D 1401**Interactive Gift Express Inc. v. Compuserve Inc.****U.S. Court of Appeals Federal Circuit**

No. 99-1324

Decided July 13, 2001

Headnotes**[1] Patent construction — Claims — Broad or narrow (§125.1303)****PATENTS****Patent construction — Claims — Defining terms (§125.1305)**

Consumer's home may be "point of sale location," as that term is used in independent claims of patent for system for reproducing information in material objects at point of sale locations, since there is nothing in claim language precluding home from being such location, and except for requiring that "information manufacturing machine" be present, claims are silent regarding possible venues for point of sale location, since patentee's asserted definition of point of sale location, premised on specification, as place to which consumer goes "to purchase material objects," does not exclude home, and since specification further describes vending machine embodiment that could be utilized in home.

[2] Patent construction — Claims — Broad or narrow (§125.1303)

Independent claims of patent for system for reproducing information in material objects at point of sale locations do not require that point of sale location have at least two "blank material objects" onto which information is recorded, since claim language specifically recites "reproducing in a material object," since claim preambles do not require multiple material objects, since one passage in specification states that each point of sale location has "a plurality of material objects," but it is not clear whether this statement is general or limited to particular embodiment, since it is clear that "information manufacturing machine" recited in patent requires only single blank material object to fully process consumer's request, and since background section of patent states that invention relates to system for

reproducing information in “a” material object; claims do not require that point of sale locations have blank material objects for sale to consumers.

[3] Patent construction — Claims — Defining terms (§125.1305)

“Material object,” as that term is used in claims of patent for system for reproducing information in material objects at point of sale locations, cannot be construed to be information itself apart from some tangible medium, since such construction is illogical and does not accord with plain import of claim language, and since even broadest definition of “material object” in specification requires that such be “medium or device in which information can be embodied or fixed.”

[4] Patent construction — Claims — Broad or narrow (§125.1303)

Patent construction — Claims — Defining terms (§125.1305)

“Material object,” as that term is used in claims of patent for system for reproducing information in material objects at point of sale locations, cannot be construed so broadly as to include hard disk that is internal to personal computer, since “material object” is clearly and consistently portrayed in patent description as object that is separate and distinct from “information manufacturing machine” (IMM) recited in patent, removed from IMM after purchase, and used apart from IMM, since hard disk is not envisioned as being “material object” anywhere in specification, and since such broad construction is inconsistent with definition asserted by patentee before federal district court.

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[5] Patent construction — Claims — Broad or narrow (§125.1303)

Patent construction — Claims — Functional (§125.1311)

Functionality of “information manufacturing machine” (IMM) recited in patent for system for reproducing information in material objects at point of sale locations need not be divided into four “separate and distinct components” listed by federal district court, since claims at issue do not recite any of these four components, and there is no general description or definition of IMM other than narrow functional definition presented in specification; although IMM must transmit request reproduction code to, and receive authorization code from, some central device, that device need not be limited to “information control machine” (ICM) defined in specification, since there is nothing to suggest to person skilled in art that IMM would only work with ICM.

[6] Patent construction — Claims — Broad or narrow (§125.1303)

Patent construction — Claims — Process (§125.1309)

Claim of patent for system for reproducing information in material objects at point of sale locations covers “real time” transactions in which requested item of information is transmitted to “information manufacturing machine” (IMM) described in patent at or prior to time it is requested by consumer, and is not limited to embodiments that pre-store or pre-deliver information to IMM, since neither claim itself nor specification requires steps recited in claim to be performed in order, and since claim therefore does

not require pre-delivery and/or pre-storage of information.

[7] Patent construction — Estoppel (§125.07)

JUDICIAL PRACTICE AND PROCEDURE

Procedure — Prior adjudication — In general (§410.1501)

Procedure — Judicial review — In general (§410.4601)

Arguments advanced on appeal that are based on patent specification in evidence, and that are in support of party's existing claim construction, are not barred by doctrine of waiver for sole reason that they were not first presented to federal district court, since parties and district court are assumed to be familiar with specification, which is admitted into evidence in its entirety and is vital to claim construction process; thus, party is precluded from proffering argument on appeal that changes scope of claim construction it advanced at trial, but it is not barred from proffering additional arguments from specification in support of its existing claim construction.

PATENTS

[8] Patent construction — Estoppel (§125.07)

JUDICIAL PRACTICE AND PROCEDURE

Procedure — Prior adjudication — In general (§410.1501)

Procedure — Defenses — Estoppel (§410.1805)

Arguments advanced on appeal by patent infringement plaintiff in support of its construction of claims at issue are not barred by doctrine of waiver, since arguments neither narrow nor broaden definitions advanced in binding report submitted by plaintiff at trial, and thus are consistent with plaintiff's binding definitions; arguments are not barred by doctrine of judicial estoppel, since plaintiff did not succeed at trial and then reverse its position on claim construction.

Particular Patents

Particular patents — Electrical — Information systems

4,528,643, Freeny, system for reproducing information in material objects at a point of sale location, judgment of non-infringement vacated.

Case History and Disposition

Appeal from the U.S. District Court for the Southern District of New York, Jones, J.; 47 USPQ2d 1797.

Action by Interactive Gift Express Inc., n/k/a E-Data Corp., against CompuServe Inc., Broderbund Software Inc., Intuit Inc., Internet Software Inc. n/k/a Internet Shopping Network Inc., Softlock Services

Inc., Telebase Systems Inc. n/k/a CDnow Inc., The Library

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Corp., Waldenbooks, Ziff-Davis Publishing Co., Apogee Software Ltd., and Soft & Net Distribution S.A. for patent infringement. Plaintiff appealed from stipulated judgment of non-infringement, which was vacated and remanded. On combination petition for panel rehearing and rehearing en banc, panel rehearing is granted for limited purpose of addressing issues of waiver and judicial estoppel, rehearing en banc is denied, and previous opinion, issued November 3, 2000 (56 USPQ2d 1647), is withdrawn and replaced by new panel opinion that does not alter disposition of case.

Attorneys:

Alberts L. Jacobs Jr., Daniel A. Ladow, and Philip M. Weiss, of Graham & James, New York, N.Y., for plaintiff-appellant.

Walter E. Hanley Jr., of Kenyon & Kenyon, New York, for defendant-appellee Internet Software Inc. (n/k/a Internet Shopping Network Inc.).

Carl Oppedahl, of Oppedahl & Larson, Dillon, Colo., for defendant-appellee Softlock Services Inc.

Timothy J. O'Hearn and David B. Cochran, of Jones, Day, Reavis & Pogue, Cleveland, Ohio, for defendant-appellee CompuServe Inc.

Robert Thomas Maldonado and Peter David Murray, of Cooper & Dunham, New York, for defendant-appellee Waldenbooks.

George F. Pappas and James R. Burdett, of Venable, Baetjer, Howard & Civiletti, Washington, D.C., for defendant-appellee The Library Corp.

Claude M. Stern, David C. McIntyre, Susan M. Reid, and Marta Y. Beckwith, of Fenwick & West, Palo Alto, Calif., for defendant-appellees Broderbund Software Inc. and Intuit Inc.

Catherine M. McGrath and Louis Greco, of Brown Raysman, New York, for defendant-appellee Ziff-Davis Publishing Co.

Griffith G. deNoyelles Jr., of Chernofsky & deNoyelles, New York, for defendant-appellee Telebase Systems Inc. (n/k/a CDnow Inc.).

Judge:

Before Mayer, chief judge, and Newman, Michel, Lourie, Rader, Schall, Bryson, Gajarsa, and Linn, circuit judges.*

Footnotes

* Circuit Judges Clevenger and Dyk did not participate in the disposition of this appeal.

Opinion Text

Opinion By:

Per Curiam.

ORDER

A combined petition for panel rehearing and rehearing en banc was filed by Broderbund Software, Inc. ("Broderbund") and Intuit, Inc. ("Intuit"), and joined in by Waldenbooks, The Library Corporation, Internet Software, Inc. (now known as Internet Shopping Network, Inc.), Compuserve, Inc., and Telebase Systems, Inc. (now known as CDnow, Inc.). A response thereto was invited by the court and filed by Interactive Gift Express, Inc. (now known as E-Data, Inc.) ("IGE"). Leave to file a reply to IGE's response was requested by, and granted to, Broderbund and Intuit, and a reply was filed. Thereafter, these filings were referred to the merits panel that heard the appeal and then referred, along with the panel's new opinion, to the circuit judges who are in regular active service.

Upon consideration thereof,

IT IS ORDERED THAT:

- (1) the petition for panel rehearing is granted for the limited purpose of addressing the issues of waiver and judicial estoppel, and
- (2) the petition for rehearing en banc be, and the same hereby is, denied, and
- (3) the previous opinion of the court in this appeal, issued on November 3, 2000 and reported at 231 F.3d 859 [56 USPQ2d 1647], is withdrawn. The new opinion accompanies this order.

Full Text of Opinion

U.S. Court of Appeals Federal Circuit

Judge:

Before Schall, circuit judge, Plager, senior circuit judge,* and Linn, circuit judge.

Footnotes

* Judge Plager assumed Senior Judge status on November 30, 2000.

Opinion Text

Opinion By:

Linn, J.

Interactive Gift Express, Inc. ("IGE"), now known as E-Data, Corp., seeks review of a judgment of noninfringement of U.S. Patent No. 4,528,643 ("Freeny patent") entered by the United States District Court for the Southern District of New York on March 12, 1999. Because the district court erred as a matter of law in the construction of each of the five claim terms giving rise to IGE's noninfringement stipulation, we vacate and remand.

The petition for panel rehearing was granted to address issues of waiver and judicial estoppel, and we have modified our original opinion accordingly. The changes take note of IGE's binding positions and acknowledge

our doctrines of waiver and judicial estoppel, but do not alter our disposition of this case.

BACKGROUND

A. The Freeny Patent

The Freeny patent is directed to a system for reproducing information in material objects at point of sale locations. Prior to the invention disclosed in the Freeny patent, information disseminated to consumers in material objects, such as tape recordings, books, and records, was recorded onto the material objects at a central manufacturing facility, and the material objects were then shipped to remote retail locations for sale. These systems required centralized manufacturing facilities for reproducing the information in the material objects and extended distribution networks for distributing the material objects, once made, to various point of sale locations for sale to consumers. The manufacturing facilities and distribution networks represented substantial costs ultimately borne by consumers.

In such prior art systems, manufacturers had to estimate consumer demand for each new information-specific product and had to manufacture and ship quantities of material objects sufficient to meet the estimated demand at each retail location. Retailers had to make similar estimates to determine how many material objects for each information-specific product to order and keep in inventory. A low estimate of consumer demand resulted in unsatisfied customers and lost sales. On the other hand, high estimates left some material objects unsold, resulting in unrecouped costs.

To overcome these and other related problems, the Freeny patent provides a system for the distributed manufacture and sale of material objects at multiple locations directly serving consumers. The system includes a central control station, referred to in the Freeny patent as an “information control machine” or “ICM,” and a plurality of remotely located manufacturing stations referred to as “information manufacturing machines” or “IMMs.” At each IMM, a consumer selects the desired information and initiates a communication from the IMM to the ICM to gain authorization for copying of the selected information onto a desired type of material object. The consumer then waits for the IMM to receive the authorization, after which the selected information is copied by the IMM onto a blank material object. The invention can be used with a wide variety of information and material objects, such as music on cassettes and text on paper. Irrespective of the type of information and material object, the invention requires the purchase of the material object by the consumer, and the material object must contain information that was copied onto it at the point of sale location.

According to the Freeny patent, the information can be copied onto a selected type of material object whenever a consumer requests it. Consumer demand thus can be met without having to rely on manufacturing estimates and without having to bear the costs associated with overproduction, inventory control, shipping, and warehousing. The Freeny system also provides “for reproducing or manufacturing material objects at point of sale locations only with the permission of the owner of the information, thereby assuring that the owner of the information will be compensated in connection with such reproduction.” Freeny patent, col. 4, ll. 8-13. The Freeny patent, in the description of the background of the invention, states that the invention overcomes the problem of “how to manufacture and distribute material objects embodying ... information in an economical and efficient manner and in a manner which virtually assures that the owners of [the] information will be compensated in connection with the sale of such material objects.” Freeny patent, col. 3, ll. 28-33.

Claim 1 of the Freeny patent is representative of the method claims at issue and defines the invention as follows:

1. A method for reproducing information in material objects utilizing information manufacturing machines located at point of sale locations, comprising the steps of:
 providing from a source remotely located with respect to the information manufacturing machine the information to be reproduced to the information manufacturing machine, each information being uniquely identified by a catalog code;
 providing a request reproduction code including a catalog code uniquely identifying the information to be reproduced

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to the information manufacturing machine requesting to reproduce certain information identified by the catalog code in a material object;

providing an authorization code at the information manufacturing machine authorizing the reproduction of the information identified by the catalog code included in the request reproduction code; and

receiving the request reproduction code and the authorization code at the information manufacturing machine and reproducing in a material object the information identified by the catalog code included in the request reproduction code in response to the authorization code authorizing such reproduction.

Freeny patent, col. 28, ll. 22-47.

Exemplary of the apparatus claims is claim 37, which reads as follows:

37. An apparatus for reproducing information in material objects at point of sale locations, comprising:

an information manufacturing machine located at a point of sale location for reproducing information in material objects, each information to be reproduced being uniquely identified by a catalog code and each information being received from a source remotely located with respect to the information manufacturing machine and each information being stored in the information manufacturing machine, the information manufacturing machine receiving a request reproduction code including a catalog code uniquely identifying the information to be reproduced and being adapted to provide an authorization code including the catalog code included in the request reproduction code, and the information manufacturing machine being adapted to reproduce the information identified by the catalog code in a material object in response to receiving the authorization code.

Freeny patent, col. 36, ll. 45-64.

B. The Accused Activities

The defendants are computer software and publishing companies and one retail bookstore. Plaintiff contends that the computer software and publishing companies infringe the Freeny patent by selling software or documents "online," that is, over the Internet and the World Wide Web. Plaintiff maintains that the retail bookstore infringes the Freeny patent by selling books that include a CD-ROM containing encrypted computer applications, access to which is not possible until the consumer retrieves a password. Plaintiff, through the construction it proffered in its Revised Claim Construction Report of November 12, 1996, has effectively conceded that none of the defendants are direct infringers.

With the one exception of the retail bookstore defendant, all of the accused systems distribute information directly to consumers' personal computers without using an intermediate retail location, the consumer instead dealing directly with a web-site over the Internet. Information is distributed and

downloaded onto a consumer's own internal hard disk or other storage device without the purchase of any material object such as a floppy disk or CD-ROM.

In the case of the CD-ROMs sold to consumers by the retail bookstore defendant, if a consumer is interested in one or more of the encrypted programs contained on the CD-ROM, a password must first be requested. The password enables the consumer to decrypt the desired program and copy it for later use. As with the other accused systems, the CD-ROM product avoids the need for a consumer to purchase a material object, such as a floppy disk or a CD-ROM, because the decrypted data is copied directly onto the consumer's own storage device.

C. Proceedings Below

The district court limited discovery to claim construction matters and ordered IGE to file a binding claim construction report. There are five disputed claim limitations. IGE's binding report dealt with four of them: "point of sale location" (referred to in the report as "point of sale"); "material object"; "information manufacturing machine"; and "authorization code." The fifth is termed the "real-time transactions" limitation, arising out of an alleged requirement that certain steps of claim 1 be performed in order, and requiring that the information be provided to and stored at the IMM before the consumer requests it. Because there is no claim term directly associated with this "limitation" and IGE did not

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consider it to be a limitation, IGE did not provide an entry for it in its binding report. The report identified these four terms, and others not relevant to this appeal, as "technical terms ... which are used differently from the normal usage in everyday language, but are defined in the patent as originally filed."

For each of these terms, the binding report provided what IGE termed a "simple definition" and also provided the location in the patent specification where these terms were defined. This information is as follows: (1) the simple definition of "point of sale" is "[t]he place at which the consumer or purchaser makes the purchase," and it is defined in the specification at "Col. 5, Lines 47-50"; (2) the simple definition of "material object" is "[a] paper with printed information, or a recording on a floppy disk, hard drive, or tape etc.," and it is defined in the specification at "Col. 4, Lines 36-59"; (3) the simple definition of "information manufacturing machine" is "[t]he computer system used by the consumer to make the point of sale purchase," and it is defined in the specification at "Col. 5, Lines 32-47, etc."; and (4) the simple definition of "authorization code" is "[t]his code is [sic] enables the information manufacturing machine (the consumers [sic - consumer's] computer system) to reproduce the electronic data in a material object," and it is defined in the specification at "Col. 6, Lines 1-23."

After receiving IGE's report and the parties' claim construction briefs, the court, on May 15, 1998, rendered an opinion and order construing the claims of the Freeny patent. *See Interactive Gift Express, Inc. v. Compuserve Inc.*, 47 USPQ2d 1797 (S.D.N.Y. 1998). The district court did not address invalidity. The district court's opinion contained a thorough and careful analysis of the Freeny patent and the relevant legal standards for claim construction. *See id.* The district court devoted most of its lengthy claim construction to the five disputed claim limitations. *See id.*

After the district court provided its claim construction of the five above-noted claim limitations, the parties entered into a Stipulated Order and Judgment ("Judgment"). *See Interactive Gift Express, Inc. v. Compuserve Inc.*, No. 95-CV-6871 (S.D.N.Y. Mar. 12, 1999) (judgment and order) ("*IGE Judgment*"). The district court made no findings of fact regarding infringement. In the Judgment, IGE conceded that none of the defendants had in the past infringed, or was then infringing, any claim of the Freeny patent as construed by the court. *See IGE Judgment*, slip op. at 1. The Judgment stated specifically that "no method, system, or apparatus of any defendant includes any" of the five disputed claim limitations. *Id.*

In appealing the judgment, IGE challenges the district court's construction of each of the disputed claim limitations. Counsel for IGE acknowledged during the oral hearing before this court that in light of the stipulation entered into by the parties as part of the Judgment, and in view of the fact that the parties have stipulated not to what the accused methods or products are but only to what they are not, IGE must show that the district court was wrong in its construction of all five of the disputed claim limitations to prevail in this appeal.

DISCUSSION

A. Standard of Review

A finding of noninfringement requires a two-step analytical approach. First, the claims of the patent must be construed to determine their scope. See *Carroll Touch, Inc. v. Electro Mech. Sys., Inc.*, 15 F.3d 1573, 1576, 27 USPQ2d 1836, 1839 (Fed. Cir. 1993). Second, a determination must be made as to whether the properly construed claims read on the accused device. See *id.* In this case, IGE has conceded the second part of the infringement analysis, leaving only the question of the propriety of the district court's claim construction in issue. Claim construction is a matter of law and is reviewed *de novo* on appeal. See *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1456, 46 USPQ2d 1169, 1174 (Fed. Cir. 1998) (en banc).

B. Analysis

In this opinion, we focus on the construction of the five disputed claim limitations as provided in the conclusions of the district court's claim construction, and upon which IGE's stipulations in the Judgment are premised. In construing claims, the analytical focus must begin and remain centered on the language of the claims themselves, for it is that language that the patentee chose to use to "particularly point[] out and distinctly claim[] the subject matter which the patentee regards as his invention." 35 U.S.C. §112, ¶ 2.

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"It is well-settled that, in interpreting an asserted claim, the court should look first to the intrinsic evidence of record, i.e., the patent itself, including the claims, the specification and, if in evidence, the prosecution history. Such intrinsic evidence is the most significant source of the legally operative meaning of disputed claim language." *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582, 39 USPQ2d 1573, 1576 (Fed. Cir. 1996) (citation omitted). All intrinsic evidence is not equal however. See *id.* at 1582, 39 USPQ2d at 1576-77 (delineating a hierarchy among the intrinsic evidence).

First, we look to the claim language. See *id.*; *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305, 51 USPQ2d 1161, 1165 (Fed. Cir. 1999) ("The starting point for any claim construction must be the claims themselves."); *Bell Communications Research, Inc. v. Vitalink Communications Corp.*, 55 F.3d 615, 620, 34 USPQ2d 1816, 1819 (Fed. Cir. 1995) (noting first the mandate to consult the claims). Then we look to the rest of the intrinsic evidence, beginning with the specification and concluding with the prosecution history, if in evidence. See *Vitronics*, 90 F.3d at 1582, 39 USPQ2d at 1576-77 (delineating this order); *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979, 34 USPQ2d 1321, 1329 (Fed. Cir. 1995) ("Claims must be read in view of the specification, of which they are a part."), *aff'd*, 517 U.S. 370 [38 USPQ2d 1461] (1996); *Bell Communications*, 55 F.3d at 620, 34 USPQ2d at 1819 (noting first the mandate to consult the claims, followed by inspection of the rest of the specification).

If the claim language is clear on its face, then our consideration of the rest of the intrinsic evidence is restricted to determining if a deviation from the clear language of the claims is specified. A deviation

may be necessary if “a patentee [has chosen] to be his own lexicographer and use terms in a manner other than their ordinary meaning.” *Vitronics*, 90 F.3d at 1582, 39 USPQ2d at 1576. A deviation may also be necessary if a patentee has “relinquished [a] potential claim construction in an amendment to the claim or in an argument to overcome or distinguish a reference.” *Elkay Mfg. Co. v. Ebco Mfg. Co.*, 192 F.3d 973, 979, 52 USPQ2d 1109, 1113 (Fed. Cir. 1999). If however the claim language is not clear on its face, then our consideration of the rest of the intrinsic evidence is directed to resolving, if possible, the lack of clarity.

Resort to the specification is particularly important in this case because IGE has conceded that the claim limitations in dispute include technical terms that are defined in the specification. However, in looking to the specification to construe claim terms, care must be taken to avoid reading “limitations appearing in the specification ... into [the] claims.” *Intervet Am., Inc. v. Kee-Vet Lab., Inc.*, 887 F.2d 1050, 1053, 12 USPQ2d 1474, 1476 (Fed. Cir. 1989). “We recognize that there is sometimes a fine line between reading a claim in light of the specification, and reading a limitation into the claim from the specification.” *Comark Communications, Inc. v. Harris Corp.*, 156 F.3d 1182, 1186, 48 USPQ2d 1001, 1005 (Fed. Cir. 1998). In locating this “fine line” it is useful to remember that we look “to the specification to ascertain the meaning of the claim term as it is used by the inventor in the context of the entirety of his invention,” and not merely to limit a claim term. *Id.* at 1187, 48 USPQ2d at 1005.

If the meaning of the claim limitations is apparent from the totality of the intrinsic evidence, then the claim has been construed. If however a claim limitation is still not clear, we may look to extrinsic evidence to help resolve the lack of clarity.¹ Relying on extrinsic evidence to construe a claim is “proper only when the claim language remains genuinely ambiguous after consideration of the intrinsic evidence.” *Bell & Howell Document Mgmt. Prods. Co. v. Altek Sys.*, 132 F.3d 701, 706, 45 USPQ2d 1033, 1038 (Fed. Cir. 1997); *see also Helifix Ltd. v. Blok-Lok, Ltd.*, 208 F.3d 1339, 1346, 54 USPQ2d 1299, 1303 (Fed. Cir. 2000); *Key Pharms. v. Hercon Lab. Corp.*, 161 F.3d 709, 716, 48 USPQ2d 1911, 1917 (Fed. Cir. 1998); *Vitronics*, 90 F.3d at 1583-84, 39 USPQ2d at 1577-78. “Such instances will rarely, if ever, occur.” *Vitronics*, 90 F.3d at 1585, 39 USPQ2d at 1579.

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Extrinsic evidence may always be consulted, however, to assist in understanding the underlying technology. *See Pitney Bowes*, 182 F.3d at 1309, 51 USPQ2d at 1168 (“[C]onsultation of extrinsic evidence is particularly appropriate to ensure that [a judge's] understanding of the technical aspects of the patent is not entirely at variance with the understanding of one skilled in the art.”); *Mantech Envtl. Corp. v. Hudson Envtl. Servs., Inc.*, 152 F.3d 1368, 1373, 47 USPQ2d 1732, 1737 (Fed. Cir. 1998); *Vitronics*, 90 F.3d at 1585, 39 USPQ2d at 1579 (“Had the district court relied on the expert testimony and other extrinsic evidence solely to help it understand the underlying technology, we could not say the district court was in error.”). But extrinsic evidence may never be used “for the purpose of varying or contradicting the terms in the claims.” *Markman*, 52 F.3d at 981, 34 USPQ2d at 1331.

Throughout the construction process, it is important to bear in mind that the viewing glass through which the claims are construed is that of a person skilled in the art. *See Intellicall, Inc. v. Phonometrics, Inc.*, 952 F.2d 1384, 1387, 21 USPQ2d 1383, 1386 (Fed. Cir. 1992); *ZMI Corp. v. Cardiac Resuscitator Corp.*, 844 F.2d 1576, 1579, 6 USPQ2d 1557, 1560 (Fed. Cir. 1988); *see also Hoechst Celanese Corp. v. BP Chems. Ltd.*, 78 F.3d 1575, 1578, 38 USPQ2d 1126, 1129 (Fed. Cir. 1996) (stating that the court assigns a claim term the meaning that it would be given by persons experienced in the field of invention).

Additionally, a party's claim construction position on appeal may be subject to waiver or judicial estoppel. These doctrines are explained below in the section entitled “Waiver and Judicial Estoppel.”

Although the district court provided a thorough and accurate description of the patent and of the relevant law, its claim construction impermissibly read limitations from the specification into each of the five disputed claim limitations. We treat each of these disputed claim limitations below, and then address the issues of waiver and judicial estoppel.

I. Point of Sale Location

The district court made several findings with regard to the construction of the expression “point of sale location.” We address these findings below, agreeing with some and disagreeing with others.

1.

In response to the district court's request for binding definitions of the disputed terms, described earlier, IGE identified the passage at column 5, lines 47-50 as defining a point of sale location. That passage states that a point of sale location is “a location where a consumer goes to purchase material objects embodying predetermined or preselected information.” Freney patent, col. 5, ll. 47-50. The district court held this definition to be correct, and we agree. Clear support is provided for this definition in the Freney patent specification at column 5, lines 47-50.

2.

The district court further held that, although point of sale locations are not restricted to retail locations, a home is not a point of sale location. *See Interactive Gift Express*, 47 USPQ2d at 1810 & n.9. IGE contends that the district court was wrong. IGE urges that a point of sale location is simply the location at which the consumer makes or effects a purchase. IGE argues that the concept of a home being a point of sale location is not new, citing home shopping networks, pay-per-view cable television, and home Internet shopping. IGE further argues that the specification defines a home as a point of sale location and discloses at least two embodiments in which the home is a point of sale location. IGE also argues that the prosecution history lists several transmission systems that could be adapted for use in the home. The appellees respond that IGE's asserted definition before the district court precludes a home from being a point of sale location, and that any references in the specification to homes as point of sale locations cannot overcome this definition. The appellees further respond that the rest of the intrinsic evidence, as well as the extrinsic evidence of standard dictionaries and references, supports the district court's construction.

[1] We agree with IGE's position that a home is not precluded from being a point of sale location. Looking first, as we must, to the claim language itself, we find nothing precluding a home from being a point of sale location. *See Vitronics*, 90 F.3d at 1582, 39 USPQ2d at 1576. Except for requiring that an IMM be present, the independent claims are silent regarding the possible venues of a point of sale location.

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Looking next to the specification, *see id.* at 1582, 39 USPQ2d at 1577, we acknowledge the great likelihood that a point of sale location will not be a home, given that: (1) IGE's asserted definition, with which we agree, requires that a consumer go to a point of sale location “to purchase material objects,” Freney patent, col. 5, ll. 48-49; and (2) the specification requires, and IGE does not dispute, that the IMM be located at the point of sale location, *see, e.g.*, Freney patent, col. 5, ll. 32-33, col. 12, ll. 66-67. However, IGE's asserted definition, premised on the specification at column 5, lines 48 and 49, does not preclude a home from serving as a point of sale location, and the specification further describes a

vending machine embodiment that could be utilized in a home. *See* Freeny patent, cols. 26-27. This intrinsic evidence unambiguously allows a home to serve as a point of sale location. Therefore, it is unnecessary to address IGE's arguments alleging that the prosecution history additionally supports our conclusion.

Given the lack of ambiguity in the intrinsic evidence, it would be improper to address any of the parties' arguments relating to extrinsic evidence, such as other examples of point of sale locations and standard references. *See Vitronics*, 90 F.3d at 1583, 39 USPQ2d at 1577 ("In those cases where the public record unambiguously describes the scope of the patented invention, reliance on any extrinsic evidence is improper.").

3.

The district court also held that a point of sale location "must have ...at least two blank material objects." *Interactive Gift Express*, 47 USPQ2d at 1810. IGE argues that this limitation is not recited in the claims or required by the specification and has improperly been read into the claims from a particular embodiment. The appellees respond that the specification supports the requirement that there be two or more blank material objects. We agree with IGE that a point of sale location need not have two blank material objects.

[2] We begin, as we must, with the language of the claims. *See Vitronics*, 90 F.3d at 1582, 39 USPQ2d at 1576 (stating that construction begins with the claim language). The claim language specifically recites "reproducing in a material object." Freeny patent, col. 28, l. 44 (claim 1; emphasis added); *id.* at col. 36, l. 63 (claim 37; emphasis added). Although the single element of claim 37 initially mentions material objects in the plural, it is later modified by a singular reference and does not require more than one material object. *Compare id.* at col. 36, l. 49 with *id.* at l. 63. The preambles of the independent claims similarly recite plural "material objects," but they do so in the context of multiple IMMs and/or multiple point of sale locations. *See, e.g., id.* at col. 28, ll. 22-24 (claim 1); *id.* at col. 36, ll. 45-46 (claim 37). The preambles do not require multiple material objects at each point of sale location. Given the preambles' generality, we need not consider whether they are more than statements of intended use.

We look next to the specification. *See Vitronics*, 90 F.3d at 1582, 39 USPQ2d at 1577. We note that the district court based the requirement of two blank material objects on a passage in the specification stating that "[e]ach point of sale location has ... a plurality of blank material objects." *See Interactive Gift Express*, 47 USPQ2d at 1805 (citing to the Freeny patent, col. 12, ll. 66-68). From the passage itself, it is unclear whether this isolated statement in the specification is intended to be a general statement or to be limited to a particular embodiment. However, there is nothing in the rest of the specification supporting the position that a point of sale location is defined as having at least two blank material objects. To the contrary, it is clear that the IMM requires only a single material object to fully process a consumer's request. *See, e.g.,* Freeny patent, col. 5, ll. 21-31 ("Each [IMM] 14 is constructed to ...provide ... information ... to a reproduction unit 24 which is adapted to reproduce received information in a material object.") (underlining added). Further, the opening sentence of the background section of the Freeny patent states that "[t]he present invention relates generally to a system for reproducing information in a material object." Freeny patent, col. 1, ll. 7-8 (emphasis added).

Accordingly, we hold that the entirety of the specification dictates that the reference to a plurality be understood to refer to a "supply" of blank material objects, and that the supply can consist of one material object. *See Digital Biometrics, Inc. v. Identix, Inc.*, 149 F.3d 1335, 1345, 47 USPQ2d 1418, 1425 (Fed. Cir. 1998) (basing the claim construction

on the entire written description, despite an isolated passage in apparent conflict).

4.

The district court also held that a point of sale location must have blank material objects “available for sale to consumers.” *Interactive Gift Express*, 47 USPQ2d at 1810. IGE argues that this limitation is not recited in the claim or required by the specification and has improperly been read into the claim from a particular embodiment. Notably, the appellees do not argue in defense of this limitation. We agree with IGE that a point of sale location need not have any blank material objects separately for sale.

Looking again to the claims, nothing in the claim language itself requires that blanks be for sale. The claims require only that information be reproduced in a material object. *See, e.g.*, Freeny patent, col. 28, ll. 22-23 (preamble to claim 1) and 44-45 (step four of claim 1); *id.* at col. 36, ll. 45-46 (preamble to claim 37) and ll. 62-63 (single element of claim 37). Looking next to the specification, we note that nothing in IGE's asserted definition, derived from the Freeny patent at column 5, lines 47-50, requires that blanks be for sale. That definition refers exclusively to the purchase of non-blank material objects, that is, to “material objects embodying ... information.” *Id.*

The district court based its conclusion that blanks must be for sale on the passage at column 13, lines 25-44. *See Interactive Gift Express*, 47 USPQ2d at 1805. However, that passage does not state that the blanks are sold to the customers as blanks, but only that the retailer is reimbursed for the cost of blanks on which information is reproduced. *See Freeny patent*, col. 13, ll. 25-44. The district court, therefore, misconstrued the specific embodiment in that passage. Further, there is no support in the rest of the specification for this requirement; all of the embodiments are directed at providing material objects with information on them and not at selling blank material objects. *See, e.g., id.* at col. 13, ll. 1-13 (reproducing information on an 8-track or cassette tape); *id.* at col. 22, l. 62 - col. 23, l. 6 (describing various material objects in which information can be reproduced); *id.* at cols. 26-27 (describing the reproduction of information in the vending machine embodiment). Indeed, the opening sentence of the background section of the Freeny patent states that “[t]he present invention relates generally to a system for reproducing information in a material object.” Freeny patent, col. 1, ll. 7-8 (emphasis added).

5.

Accordingly, we construe a point of sale location to be a location where a consumer goes to purchase material objects embodying predetermined or preselected information. This construction permits a home to be a point of sale location. A point of sale location need not have more than one blank material object and it need not have any material objects separately for sale as blanks.

II. Material Object

As with the term point of sale location, the district court made several findings with regard to the construction of the term “material object.” We address these findings below, agreeing with some and disagreeing with others.

1.

The district court held that a material object is “a tangible medium or device in which information can be embodied, fixed, or stored, other than temporarily, and from which the information embodied therein can be perceived, reproduced, used or otherwise communicated, either directly or with the aid of another machine or device.” *Interactive Gift Express*, 47 USPQ2d at 1810. Although IGE admits in its brief to this court that a material object is a tangible medium, counsel for IGE argued to this court at the oral hearing that a material object is defined as the information itself and need not be a tangible medium. The

appellees respond that the district court's construction is supported by the specification.

Although the appellees do not argue that IGE has waived this argument, we note that it is being presented for the first time on appeal. However, given that the proper resolution is beyond any doubt, we exercise our discretion and consider it for the purpose of elucidating our further comments on the proper construction of the term "material object." *L.E.A. Dynatech*, 49 F.3d at 1531, 33 USPQ2d at 1843 (allowing an appellate court to consider an issue not presented below if "the proper resolution is beyond any doubt").

[3] A material object cannot be the information itself, as IGE now argues. Examining first

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the claim language, claim 1, for example, requires that the information be reproduced in a material object. *See* Freeny patent, col. 28, ll. 22-23 (preamble to claim 1) and 44-45 (step four of claim 1). If the information itself is the material object, as IGE argues, then claim 1 would require the information to be reproduced in itself. Such a construction is illogical and does not accord with the plain import of the claim language. *See White v. Dunbar*, 119 U.S. 47, 52 (1886) ("[I]t is unjust to the public, as well as an evasion of the law, to construe [a claim] in a manner different from the plain import of its terms. This has been so often expressed in the opinions of this court that it is unnecessary to pursue the subject further."); *Ethicon Endo-Surgery, Inc. v. United States Surgical Corp.*, 93 F.3d 1572, 1579, 40 USPQ2d 1019, 1024 (Fed. Cir. 1996) (rejecting a proffered construction because "the plain meaning of the claim [would] not bear [such] a reading"); *cf. Conopco, Inc. v. May Dep't Stores Co.*, 46 F.3d 1556, 1562, 32 USPQ2d 1225, 1228 (Fed. Cir. 1994) (noting that "a finding that the accused process literally infringed did not ... eviscerate the plain meaning of the [relevant] term").

Despite the plain language of the claims, we turn to the specification to discern whether IGE attributed a different meaning to the term material object. *See Vitronics*, 90 F.3d at 1582, 39 USPQ2d at 1577 ("[I]t is always necessary to review the specification to determine whether the inventor has used any terms in a manner inconsistent with their ordinary meaning."). Examining the specification, it is clear that even the broadest definition of material object in the specification requires that a material object be a "medium or device in which information can be embodied or fixed." Freeny patent, col. 4, ll. 36-38. Thus, IGE's argument that the reproduced information itself constitutes the material object is not only illogical, but unsupported in the specification as well.

2.

The district court further held that a material object must be: (a) separate and distinct from the IMM, (b) removed from the IMM after purchase, and (c) intended for use away from the point of sale location. *See Interactive Gift Express*, 47 USPQ2d at 1810. IGE argues that neither the claims nor the specification requires that a material object be separate and distinct from the IMM or intended for use at a location other than the point of sale location, and that these limitations were improperly read into the claims from the specification. The appellees respond that the district court's construction is supported by the specification. We agree with the district court on these three limitations, with one variation regarding point (c) above. On that point, we find that the material object *could* be intended for use at the point of sale location as long as it is on a device separate from the IMM.

Beginning with the claim language, we note that the preamble of claim 1, for example, describes a method in which IMMs are located at point of sale locations and in which information is reproduced in material objects utilizing the IMMs. *See* Freeny patent, col. 28, ll. 22-24. This language could be read to suggest that the material objects, which receive the reproduced information, are not part of the IMM and are intended to be purchased and removed from both the IMM and the point of sale location, but that

reading is not clear from the claim itself. The claim later describes reproducing the information in a material object, but again there is no clear indication that the material object is or is not a separate and distinct item that is to be removed from the IMM after purchase and used on another device. *See id.* at col. 28, ll. 42-45. Thus, we look to the specification for further guidance.

The Freeny patent envisions and discloses only material objects that are separate from the IMM and that can be purchased by the consumer and taken away from the IMM. *See, e.g.*, Freeny patent, col. 13, ll. 25-48 (retail store embodiment), cols. 26-27 (vending machine embodiment). The emphasis of the specification on distribution and sale consistently reveals that the material objects are intended to be separate from the IMM, removed from the IMM, and used apart from the IMM. *See, e.g.*, Freeny patent, col. 4, ll. 13-18 (“The system of the present invention solves the problems associated with manufacturing, inventory, configuration distribution and collection ... and permits sale of material objects embodying information in a more efficient, economical and profitable manner.”). These three conditions, namely, that a material object be separate and distinct from the IMM, removed from the IMM after purchase, and used apart from the IMM, are fundamental to the meaning of a material object as clearly and consistently specified in the patent description.

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See, e.g., Freeny patent, col. 4, ll. 36-59; col. 5, ll. 47-50; col. 13, ll. 36-44; col. 26, ll. 28-34.

[4] IGE contends that “material object” should be construed so broadly as to include a hard disk that is internal to a personal computer. Although the specification describes numerous material objects, a hard disk, internal or otherwise, is never mentioned as a possibility. In fact, where a hard disk is discussed, it is in relation to the implementation of particular aspects of the IMM or the ICM and not as an example of a material object. *See id.* at col. 22, ll. 6-34. Any construction of the expression “material object” which encompasses a hard disk is not only not envisioned anywhere in the specification but is also inconsistent with the definition of a point of sale location asserted by IGE before the district court. Specifically, a consumer would not go to a point of sale location to purchase an internal hard disk embodying predetermined or preselected information. *See id.* at col. 5, ll. 47-50.

3.

The district court also held that a material object “[m]ust be offered for sale independently from the information that may be reproduced onto the material object.” *Interactive Gift Express*, 47 USPQ2d at 1810. The district court applied this same limitation to a point of sale location. For the reasons discussed earlier with respect to a point of sale location, we again disagree with the district court's reading of this condition into the claims.

4.

Accordingly, we construe a material object to be a tangible medium or device in which information can be embodied, fixed, or stored, other than temporarily, and from which the information embodied therein can be perceived, reproduced, used or otherwise communicated, either directly or with the aid of another machine or device. A material object must be offered for sale, and be purchasable, at point of sale locations where at least one IMM is located. Further, a material object must be separate and distinct from the IMM, removed from the IMM after purchase, and intended for use on a device separate from the IMM either at the point of sale location or elsewhere. “Material object” does not encompass the hard disk component of a home personal computer. Finally, a material object need not be offered for sale independently from the information that may be reproduced onto the material object, that is, as a blank.

III. Information Manufacturing Machine

As with the term point of sale location, the district court made several findings with regard to the construction of the term IMM. For this term, however, we disagree with most of the district court's findings. We address each below.

1.

The district court required that the IMM functionality be divided into at least the following four “*separate and distinct*” components: (a) a Manufacturing Control Unit, (b) a Master File Unit, (c) an Information Manufacturing Unit, and (d) a Reproduction Unit.” *Interactive Gift Express*, 47 USPQ2d at 1810 (emphasis added). IGE maintains that the district court improperly read the limitations of an embodiment into the claims. The appellees respond that these four components are required because Figure 1 of the Freeny patent, which contains these components, depicts the invention and not merely an embodiment of the invention. We agree with IGE.

[5] Again, we turn first to the claim language itself. The independent claims do not recite any of these four components and do not convey any clear meaning of an IMM to one skilled in the art. The only limitations in the exemplary independent claims pertaining to the IMM relate to its placement at a point of sale location and to certain functions that it must perform, namely, storing information to

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be reproduced, receiving a request reproduction code, receiving an authorization code, and reproducing the requested information in a material object. *See Freeny patent*, col. 28, ll. 26-47 (claim 1), col. 36, ll. 47-64 (claim 37).

The specification describes an embodiment of the IMM containing the four components noted by the district court and performing the functions recited in the claims. *See id.* at col. 6, ll. 27-30, col. 9, l. 39 - col. 10, l. 49. The disclosed embodiment of the IMM also performs the functions, not explicitly recited in either claim 1 or claim 37, of transmitting a request reproduction code and receiving and decoding encoded information. Of these, only five functions, namely, storing information to be reproduced, receiving and transmitting a request reproduction code, receiving an authorization code, and reproducing the requested information in a material object, are critical to the operation of the IMM as defined in the specification. *See id.* at col. 5, l. 21 – col. 6, l. 23. As explained below, the receiving and decoding of encoded information is not essential to the present invention. There is no general description or definition of what constitutes an IMM other than this narrow functional definition presented in the specification. That is the only definition on which the public can rely, and it is therefore reasonable to conclude that an IMM must contain these five functions. To the extent that the district court's decision, by requiring all four components of the disclosed IMM to be present, requires more than these five critical functions to be performed by the IMM, it is in error.

In its analysis, the district court looked to the specification, and specifically the embodiment depicted in Figure 1, and correctly concluded that the disclosed IMM contained each of the four functional components listed above. *See Interactive Gift Express*, 47 USPQ2d at 1807 (After stating that “the IMM is comprised of four separate and distinct components,” the district court cited to column 6, lines 27-30, which identifies the four components in the IMM depicted in Figure 1.). However, while the five functions identified above are required in an IMM, there is nothing in the specification that requires that these functions be performed by the particular components of Figure 1 or that such components be separate and distinct. *See Freeny patent*, col. 9, l. 39 - col. 10, l. 68. These five functions of the IMM are all of a type that can be performed within a computer, and it is well within the reasonable expectation of a person skilled in the art to move the boundaries between the four identified components to suit a desired application. Such movement would allow, for example, any one piece of the IMM to perform

any number of the five required functions. *See Intellicall*, 952 F.2d at 1387, 21 USPQ2d at 1386.

2.

The district court also held that the IMM must “receive a ‘request reproduction code,’” must “transmit the ‘request reproduction code’ to an ‘information control machine’ (‘ICM’),” and must “receive an ‘authorization code’ from the ICM.” *Interactive Gift Express*, 47 USPQ2d at 1810. As just explained, we agree that an IMM must receive and transmit these codes. We further agree that the IMM must transmit the request reproduction code to, and receive the authorization code from, a central device, such as an ICM, but the device need not be restricted to an ICM.

We note first that neither claim 1 nor claim 37 recites the details of the ICM of the preferred embodiment. However, it is critical to the operation of the IMM, as defined in the specification, that the IMM send the request reproduction code to the same device that then sends the authorization code to the IMM. *See Freeny patent*, col. 5, l. 51 - col. 6, l. 23. While this device takes the form of an ICM in the preferred embodiment, there is nothing in the specification that would suggest to a person skilled in the art that an IMM would only work with the particular ICM defined in the specification. *See id.* at col. 5, ll. 32-50 (emphasizing that the ICM is located at a location remote from the IMM); *Intellicall*, 952 F.2d at 1387, 21 USPQ2d at 1386.

Thus, we construe the term IMM to require communication with a remote device, such as but not restricted to an ICM, and hold that the district court's definition of IMM as requiring communication with an ICM is erroneous.

3.

The district court also held that the Master File Unit and the Reproduction Unit components of the IMM must, at a minimum, contain a number of detailed attributes. *See Interactive Gift Express*, 47 USPQ2d at 1810. IGE argues that the language of the claims does not recite any of these limitations. Again, we agree with IGE.

There is no recitation of the specific attributes of the Master File Unit or the Reproduction Unit in the language of the independent claims. There is also no support for these limitations in the text of the specification referenced in IGE's asserted definition of the IMM before the district court. *See Freeny patent*, col. 5, ll. 32-47. Further, the invention is primarily concerned with distributed reproduction, and there is nothing to suggest that a person skilled in the art would not readily understand that the invention could be practiced without the received information being encoded, without decoding the received information, or without receiving information “on a unidirectional signal path ... in analog

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form.” *Interactive Gift Express*, 47 USPQ2d at 1810; *see Freeny patent*, col. 1, ll. 7-9, col. 4, ll. 13-18 (revealing that the invention is primarily concerned with distributed reproduction); *Intellicall*, 952 F.2d at 1387, 21 USPQ2d at 1386 (indicating that terms are construed according to the understanding of one skilled in the art). We conclude that the district court erred and impermissibly read these limitations into the claims.

4.

Accordingly, we hold that an IMM must contain one or more components for performing at least the functions of: (1) storing information to be reproduced; (2) receiving a request reproduction code; (3) transmitting a request reproduction code to a device remotely located from the IMM; (4) receiving an authorization code from the device remotely located from the IMM; and (5) reproducing the requested

information in a material object in response to receiving the authorization code. An IMM need not contain the four separate and distinct components of the preferred embodiment.

IV. Authorization Code

The district court made several findings with regard to the construction of the term authorization code. We agree with some of these findings, disagree with others, and address them below.

1.

The district court held that an authorization code must “include a code that enables the IMM to decode the information that is to be reproduced in a material object and that was previously stored in encoded form at the IMM.” *Interactive Gift Express*, 47 USPQ2d at 1809. The district court reasoned that the “seminal component” of the disclosed authorization codes was the encoded catalog decipher program that allowed the IMM to decode information. *See id.* at 1805. Without this component, the district court continued, “the IMM would be unable to convert the information from its encoded, unusable format to its decoded, usable format.” *Id.* Accordingly, the district court held that “the encoded catalog decipher program is the true ‘authorizing’ mechanism,” and the authorization code needs such a component. *Id.*

IGE argues that an authorization code need only authorize copying and need not provide decoding information. IGE points to the language of the claims to substantiate its argument. The appellees respond that the portions of the specification noted in IGE's asserted definition before the district court require that the authorization code perform a decoding function, and that the specification does not disclose an authorization code without such a function. The appellees also maintain that an authorization code must include an IMM code, used to identify the IMM intended to receive the authorization code from the ICM. The appellees further respond that the definition of the term authorization code requires that it be transmitted electronically between the IMM and the ICM.

We agree with IGE that the authorization code need only authorize copying. Our holding is based on the claim language and the language of the specification identified in IGE's asserted definition before the district court. First, the language of the independent claims does not require that the information be encoded, much less that the authorization code have decoding information. Encoded information is not claimed until claim 5. Further, the claim language itself suggests that the sole function of the authorization code is “authorizing ...reproduction.” Freeny patent, col. 28, l. 47 (claim 1).

Second, in response to the district court's request for a binding definition of all disputed terms, IGE identified the passage in the Freeny patent at column 6, lines 1-23 as defining the term authorization code. At two points in that passage, the purpose of the authorization code is stated to be providing permission for copying. In the context of the preferred embodiment, it states that “if [the request for reproduction is] approved, [the ICM] provides an authorization code.” *Id.* at col. 6, ll. 4-5. Later, it notes that information is reproduced only with permission, “such permission being indicated by the authorization code.” *Id.* at col. 6, ll. 21-22. The only reference in this passage to decoding information merely states that such decoding occurs in the IMM of the preferred embodiment “[i]n response to receiving the authorization code.” *Id.* at col. 6, ll. 7-8. This simply does not state that the authorization code must include a decoding code. It does indicate a sequence to the events or a causality between reception of the authorization code and the decoding action, but this is expected given that information,

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which may or may not be encoded, cannot be decoded before permission to reproduce has been received. *See id.* at col. 6, l. 17.

The appellees' arguments that an authorization code must also include an IMM code and that the authorization code must be transmitted electronically are not persuasive. Neither of these proposed limitations is mandated by the claim language itself or the specification. Although the preferred embodiment routes the authorization code with the use of an IMM code and electronic transmission, these features are not recited in the independent claims and we are not at liberty to read them into the claims. See *Laitram Corp. v. Cambridge Wire Cloth Co.*, 863 F.2d 855, 865, 9 USPQ2d 1289, 1299 (Fed. Cir. 1988) ("References to a preferred embodiment, such as those often present in a specification, are not claim limitations."); *SRI Int'l. v. Matsushita Elec. Corp. of Am.*, 775 F.2d 1107, 1121, 227 USPQ 577, 585-86 (Fed. Cir. 1985) (en banc); cf. *Toro Co. v. White Consol. Indus., Inc.*, 199 F.3d 1295, 1301, 53 USPQ2d 1065, 1069 (Fed. Cir. 1999) ("It is well established that the preferred embodiment does not limit broader claims that are supported by the written description.").

2.

The district court also held that the authorization code is separate and distinct from the request reproduction code. This is clearly correct. First, these codes are separately recited in claim 1. Compare Freeny patent, col. 28, ll. 31-36 (origination of request reproduction code) with *id.* at ll. 37-41 (origination of authorization code). Second, the specification supports this distinction. In the preferred embodiment, a request reproduction code originates from the user and is passed from the user to the IMM and then to the ICM. See *id.* at col. 5, l. 60 - col. 6, l. 3. However, an authorization code originates from the ICM and is passed from the ICM to the IMM. See *id.* at col. 6, ll. 3-7.

3.

As discussed above with respect to the IMM, the district court further held that an ICM must transmit the authorization code to the IMM. This is a limitation associated with the ICM or the IMM and not with the term "authorization code." Because an authorization code need only authorize copying, it would be improper in this case to construe the term "authorization code" to include limitations regarding its origin or its destination. See *Intervet*, 887 F.2d at 1053, 12 USPQ2d at 1476; *Laitram*, 863 F.2d at 865, 9 USPQ2d at 1299; *SRI Int'l*, 775 F.2d at 1121, 227 USPQ at 585-86; cf. *Toro*, 199 F.3d at 1301, 53 USPQ2d at 1069.

4.

Accordingly, we hold that: (1) an authorization code must authorize copying but need not provide decoding information; (2) the term "authorization code" is not to be construed to require that it include an IMM code or that it be transmitted electronically; and (3) an authorization code is separate and distinct from a request reproduction code.

V. Real-time Transactions

The district court held that the claimed invention does not "cover real-time transactions where the requested item of information is transmitted to the IMM at the time it is requested by the consumer." *Interactive Gift Express*, 47 USPQ2d at 1809. The district court noted that this requirement is equivalent to requiring that step one of the claim be performed prior to step four. See *Interactive Gift Express*, 47 USPQ2d at 1802, 1804.

IGE argues that such an order or sequence of steps is not recited, nor required, by the claims. IGE further argues that claim 1 does not exclude real-time delivery of information but that claim 37 does and, therefore, the doctrine of claim differentiation requires a broader construction of claim 1. IGE also claims that real-time delivery is disclosed in the specification and points to embodiments in the specification that it alleges utilize real-time delivery.

The appellees respond that the claim language and the specification limit the claim to methods that do not utilize real-time delivery. With regard to the claim language, the appellees point out that claim 1 recites that the information is reproduced in the material object “in response to” receiving the authorization code. The appellees maintain that this requires the information to be locally stored prior to receipt of the authorization code. With regard to the specification, the appellees maintain that even though the “concept” of real-time delivery is disclosed, it is not claimed and is therefore dedicated to the public.

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1.

[6] We agree with IGE. As the district court noted, the only way that claim 1 can be limited to embodiments in which the information is predelivered and prestored is if at least the first and fourth steps of the method have to be performed in order. Unless the steps of a method actually recite an order, the steps are not ordinarily construed to require one. *See Loral Fairchild Corp. v. Sony Corp.*, 181 F.3d 1313, 1322, 50 USPQ2d 1865, 1870 (Fed. Cir. 1999) (stating that “not every process claim is limited to the performance of its steps in the order written”). However, such a result can ensue when the method steps implicitly require that they be performed in the order written. *See Loral*, 181 F.3d at 1322, 50 USPQ2d at 1870 (stating that “the language of the claim, the specification and the prosecution history support a limiting construction[, in which the steps must be performed in the order written,] in this case”); *Mantech*, 152 F.3d at 1376, 47 USPQ2d at 1739 (holding that “the sequential nature of the claim steps is apparent from the plain meaning of the claim language and nothing in the written description suggests otherwise”). In this case, nothing in the claim or the specification directly or implicitly requires such a narrow construction.

Looking at the claim language, there is no reason why step one's “providing” of information to the IMM must occur before step four's “receiving the request reproduction code.” *See* Freeny patent, col. 28, ll. 26 (step one) and 42-43 (step four). Logically, information could be sent after a request is made. In the specification, two embodiments are disclosed which operate in real-time and send information after a request is made. *See id.* at col. 24, ll. 24-32 and 33-58 (explicitly describing the second system as an “embodiment”). In both of these embodiments, the “providing” of information is performed after “receiving the request reproduction code.” *See id.* at col. 24, ll. 29-30 (stating that the information would be transmitted each time it was requested) and ll. 45-46 (stating that the information is sent with the authorization code). Although the specification describes these two non-preferred embodiments as impractical and uneconomical, respectively, it does not characterize them as inoperative nor is there anything in the specification which would nullify the effect of the disclosure in supporting a claim construction that is not limited to the predelivery of information. *See id.* at col. 24, ll. 28-29 and 50.

The appellees' argument regarding the “in response to” language of the claims is unpersuasive. Even if the language “in response to” required immediate copying after the authorization code was received, which it does not, such a result could be achieved if the information were transmitted along with the authorization code, as disclosed in the Freeny patent. *See id.* at col. 24, ll. 41-46.

2.

We now address the district court's rationale for finding that at least the first and fourth steps of claim 1 must be performed in order. The district court relies on the fact that “step four does not provide for the transmission from the ICM to the IMM of the information sought to be reproduced,” and reasons from this that the information must be predelivered. *Interactive Gift Express*, 47 USPQ2d at 1803. We find this

logic unpersuasive.

As explained above, there is no reason why the claim needs to be construed to require that the steps be performed in the order written. Further, as explained below, such a construction would not read on the preferred embodiment, and therefore would “rarely, if ever, [be] correct and would require highly persuasive evidentiary support.” *Vitronics*, 90 F.3d at 1583, 39 USPQ2d at 1578; *see also Modine Mfg. Co. v. United States Int'l Trade Comm'n*, 75 F.3d 1545, 1550, 37 USPQ2d 1609, 1612 (Fed. Cir. 1996) (“[A] claim interpretation that would exclude the inventor's device is rarely the correct interpretation; such an interpretation requires highly persuasive evidentiary support”); *Hoechst*, 78 F.3d at 1581, 38 USPQ2d at 1130 (“We share the district court's view that it is unlikely that an inventor would define the invention in a way that excluded the preferred embodiment, or that persons of skill in this field would read the specification in such a way.”).

In the preferred embodiment, the following sequence of events occurs (the parenthetical notations referring to the sequence of steps recited in exemplary claim 1): (1) the user provides a request reproduction code to the IMM (step two) and the IMM receives it

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(step four); (2) the IMM sends the request reproduction code to the ICM (not claimed); (3) the ICM provides an authorization code to the IMM (step three) and the IMM receives it (step four); and (4) the IMM copies the information onto a material object (step four). As indicated in the parenthetical remarks, the steps of claim 1 are not performed in order by the preferred embodiment. They are not even performed serially in their entirety because part of step four is performed before step three, and part is performed after step three. Thus, if the claim was construed to require that the steps be performed in order, the claim would not read on the preferred embodiment. However, there is no “highly persuasive evidentiary support” for such a result. *See Vitronics*, 90 F.3d at 1583, 39 USPQ2d at 1578. Indeed, given that the claim itself and the specification both support a construction in which the steps are not performed in order, the appellees have not directed us to any evidentiary support at all.

3.

Thus, because the steps of claim 1 need not be performed in order, claim 1 does not require predelivery and/or prestorage of the information. Accordingly, we hold that claim 1 is not limited to embodiments that pre-store or pre-deliver the information to the IMM, but that it covers real-time transactions in which the requested item of information is transmitted to the IMM at or prior to the time it is requested by the consumer.

VI. Waiver and Judicial Estoppel

Before addressing the petitioning appellees' specific arguments, we briefly review the doctrines of waiver and judicial estoppel and the limits they place on the parties before the court in this case.

1.

The legal doctrine of waiver applies to a number of situations. The doctrine of waiver that we are concerned with in this case relates to preserving an issue for appeal. The Supreme Court has stated that “[i]t is the general rule, of course, that a federal appellate court does not consider an issue not passed upon below.” *Singleton v. Wulff*, 428 U.S. 106, 120 (1976); *see* 19 James Wm. Moore et al., *Moore's Federal Practice* §205.05, at 205-55 (3d ed. 1997) (“It is a long-standing rule that, in order to be reviewable on appeal, a claim or issue must have been ‘pressed or passed upon below.’”). This is because appellate courts are courts of review and “[n]o matter how independent an appellate court's

review of an issue may be, it is still no more than that —a review. *Sage Prods., Inc. v. Devon Indus., Inc.*, 126 F.3d 1420, 1426, 44 USPQ2d 1103, 1108 (Fed. Cir. 1997). Appellate courts are, however, given the discretion to decide when to deviate from this general rule of waiver. *Singleton*, 428 U.S. at 121 (“The matter of what questions may be taken up and resolved for the first time on appeal is one left primarily to the discretion of the courts of appeals, to be exercised on the facts of individual cases. We announce no general rule. Certainly there are circumstances in which a federal appellate court is justified in resolving an issue not passed on below, as where the proper resolution is beyond any doubt, or where injustice might otherwise result.” (citations and internal quotations omitted)); see 19 Moore et al., §205.05, at 205-57 to -58 (“the rule [of waiver] is prudential and may be disregarded as justice requires”). This court has enumerated a variety of reasons that might justify such a deviation. *L.E.A. Dynatech, Inc. v. Allina*, 49 F.3d 1527, 1531, 33 USPQ2d 1839, 1843 (Fed. Cir. 1995) (stating the following five reasons that could justify an appellate court's consideration of an issue not presented below, but finding none of them applicable: “(i) the issue involves a pure question of law and refusal to consider it would result in a miscarriage of justice; (ii) the proper resolution is beyond any doubt; (iii) the appellant had no opportunity to raise the objection at the district court level; (iv) the issue presents significant questions of general impact or of great public concern; or (v) the interest of substantial justice is at stake” (internal quotations and brackets omitted)); see *Cemex, S.A. v. United States*, 133 F.3d 897, 902 (Fed. Cir. 1998) (interpreting *L.E.A.* as providing justifications that would allow, but not necessarily require, an appellate court's consideration of an argument not presented to the trial court); cf. 19 Moore et al., §205.05, at 205-58 (“A circuit court will disregard the rule [of waiver] in compelling circumstances, such as ... a serious issue of public policy, a change in the law, or for error that works manifest injustice. This is particularly so if the issue has been fully briefed, if the issue is a matter of law or the record is complete, if there will be no prejudice to any party, and if no purpose is served by remand to the district court.”); accord *Becton Dickinson & Co. v. C.R. Bard, Inc.*, 922 F.2d 792, 800, 17 USPQ2d 1097, 1103

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(Fed. Cir. 1990) (stating that waiver, in the context of arguments that are not raised in the opening appeal brief, is “not governed by a rigid rule but may as a matter of discretion not be adhered to where circumstances indicate that it would result in basically unfair procedure”).

Regarding the doctrine of judicial estoppel, we first note that it is related to waiver. See *Key Pharms. v. Hercon Labs. Corp.*, 161 F.3d 709, 715, 48 USPQ2d 1911, 1915-16 (Fed. Cir. 1998) (suggesting that the “doctrines of estoppel, waiver, invited error, or the like” achieve a similar result). Although related, its focus is less on the failure to preserve the issue for appeal, as in waiver, and more on the perversion of the judicial process resulting from adopting inconsistent legal positions. *Data Gen'l Corp. v. Johnson*, 78 F.3d 1556, 1565 (Fed. Cir. 1996) (“Judicial estoppel is designed to prevent the perversion of the judicial process and, as such, is intended to protect the courts rather than the litigants.”); 18 Moore et al., Moore's Federal Practice §134-30, at 134-62 to -63 (3d ed. 1997) (noting that the doctrine of judicial estoppel has been applied broadly to prevent a party from adopting inconsistent legal positions in the same or related judicial proceedings). The doctrine provides that a party will be judicially estopped from asserting a position on appeal that is directly opposed to a position that the party successfully urged at trial. *Key Pharms.*, 161 F.3d at 715, 48 USPQ2d at 1915 (stating, in the context of a party arguing against the claim construction that it had persuaded the trial court to adopt, that “[o]rdinarily, doctrines of estoppel, waiver, invited error, or the like would prohibit a party from asserting as ‘error’ a position that it had advocated at the trial”); see *id.* at 715 n.1, 48 USPQ2d at 1915-16 n.1 (listing additional sources that endorse this characterization of judicial estoppel).

In *Key Pharmaceuticals*, the trial judge adopted the claim construction set forth by the accused infringer, Hercon Laboratories Corp. (“Hercon”). *Id.* at 712, 713-14, 48 USPQ2d at 1913, 1914-15. However, on a motion for reconsideration and on appeal, Hercon changed positions and argued that the claim construction it had urged at trial was in error. *Id.* at 715, 48 USPQ2d at 1916. This court noted that

Hercon's change in position was "an obvious attempt to salvage its invalidity case" and that there was "no [other] reason for Hercon's claim construction reversal." *Id.* This court then noted that the obvious impropriety of such reversals of position justified an estoppel, even in that case, but declined to estop Hercon out of "an abundance of fairness" because this court had not previously explicitly so ruled. *Id.* at 715-16, 48 USPQ2d at 1916. *Key Pharmaceuticals* thus stands for the proposition that a party will be judicially estopped from asserting a position on appeal that is inconsistent with a position it advocated at trial and persuaded the trial court to adopt.

2.

The doctrine of waiver is limited in its application. As it relates to claim construction, the doctrine has been applied to preclude a party from adopting a new claim construction position on appeal. *See Sage*, 126 F.3d at 1426, 44 USPQ2d at 1108 (effectively applying waiver by precluding Sage's claim construction of "elongated slot" and "container body" because, differing from the claim construction urged at trial, they were not preserved for appeal); *see also Key Pharms.*, 161 F.3d at 715, 48 USPQ2d at 1916 (condemning Hercon's proffer of a new claim construction, for the limitation "a pharmaceutically effective amount," that differed from the claim construction Hercon urged at trial); *N. Telecom Ltd. v. Samsung Elecs. Co.*, 215 F.3d 1281, 1290, 55 USPQ2d 1065, 1071 (Fed. Cir. 2000) (citing *Key Pharmaceuticals* and noting with "extreme disfavor" Samsung's presentation of a claim construction for the limitation "aluminum and aluminum oxide" that differed from the claim construction Samsung advanced at trial); *Hockerson-Halberstadt, Inc. v. Converse Inc.*, 183 F.3d 1369, 1374, 51 USPQ2d 1518, 1521 (Fed. Cir. 1999) (citing and agreeing with *Key Pharmaceuticals* but, solely due to the parties' lack of notice of the holding in *Key Pharmaceuticals*, allowing Hockerson-Halberstadt to proffer a claim construction for the limitation "pyramid shaped" that differed from the construction Hockerson-Halberstadt had urged at the district court). In each of the above-cited cases, the claim construction proffered on appeal was considered to be "new" because it changed the scope of the claim construction. The doctrine has not been invoked, however, to prevent a party from clarifying or defending the original scope of its claim construction, or from

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supporting its existing claim construction position with new citations to the specification.

This is in keeping with the common understanding that the appealable issue, and therefore the issue that is subject to waiver, is the trial court's ruling on claim construction. Although a trial court may find persuasive a specific evidentiary argument, such as one related to the specification, it does not rule on it. *See* 19 Moore et al., §205.05, at 205-55 (stating that it is a "claim or issue" that must be preserved for appeal by being "pressed or passed on below"). This distinction is in accord with the familiar principle that this court does not review supporting arguments, but only the decisions reached by the trial court. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1540, 218 USPQ 871, 880 (Fed. Cir. 1983) ("We sit to review judgments, not opinions."); *see Sage*, 126 F.3d at 1426, 44 USPQ2d at 1108 (stating that "it is our place to review judicial decisions—including claim interpretations ... —reached by trial courts").

This distinction does not compromise the basic requirement, embodied in the doctrine of waiver, that the parties develop their positions at trial. That basic requirement is reflected in *Finnigan Corp. v. International Trade Commission*, 180 F.3d 1354, 51 USPQ2d 1001 (Fed. Cir. 1999), where this court stated that "a party's argument should not be a moving target." *Id.* at 1363, 51 USPQ2d at 1007. This court explained that statement as follows:

The argument at the trial and appellate level should be consistent, thereby ensuring a clear presentation of the issue to be resolved, an adequate opportunity for response and evidentiary development by the opposing party, and a record reviewable by the appellate court that is properly

crystallized around and responsive to the asserted argument.

Id. at 1363, 51 USPQ2d at 1007 (citing *Sage*). *Finnigan* dealt with an appeal from the International Trade Commission (“ITC”), and the waiver issue was decided under the regulations and case law relevant to ITC appeals. The above comments in *Finnigan*, however, supported the further conclusion that our non-ITC case law did not preclude the application of waiver. Therefore, these comments apply generally as an explanation of the rationale underlying this doctrine of waiver.

Finnigan cites to and builds upon this court's comments in *Sage*. *Sage* emphasized the proper role of appellate review and effectively applied waiver by precluding *Sage*'s claim construction of the limitations “elongated slot” and “container body” because, differing from the claim construction urged at trial, they were not preserved for appeal. *Sage*, 126 F.3d at 1426, 44 USPQ2d at 1108 (“With a few notable exceptions, ... appellate courts do not consider a party's new theories, lodged first on appeal. ... In short, this court does not ‘review’ that which was not presented to the district court.”).

[7] The concerns expressed above in *Finnigan* and *Sage* would certainly preclude a party from changing its claim construction, that is, the scope of its claim construction, on appeal. However, those concerns would not necessarily preclude a party from proffering additional or new supporting arguments, based on evidence of record, for its claim construction. As *Finnigan* indicates, the concerns in waiver relate to issues such as: (1) whether the claim construction and arguments on appeal are consistent with those tendered at trial; (2) whether there is a clear presentation of the issue to be resolved; (3) whether there was an adequate opportunity for response and evidentiary development by the opposing party at trial; and (4) whether there is a record reviewable by the appellate court that is properly crystallized around and responsive to the asserted argument. It is evident that a party's proffer of additional support from a specification, for an existing claim construction, will not violate these concerns. This follows from the fact that the parties and the district court are assumed to be familiar with the specification because it is admitted into evidence in its entirety and is vital to the process of construing the claims, as described earlier. Thus, the emphasis of different aspects of the specification will not detract from the clarity of the claim construction issue on appeal, nor necessitate additional discovery or testimony. Accordingly, we hold that arguments that are based on a specification in evidence and that are in support of an existing claim construction are not barred by the doctrine of waiver for the sole reason that they were not first presented to the trial court.

3.

Applying the doctrine of waiver to the present case, IGE is precluded from proffering a claim construction on appeal that changes

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the scope of any of the claim construction positions that it advanced in its binding report. IGE is not barred, however, from proffering additional arguments from the specification in support of its existing claim construction. Thus, only arguments that change the scope of IGE's claim construction positions from those advanced in its binding report will be deemed to be waived. We proceed to address the appellees' assertions that IGE has presented arguments that should be deemed to be waived. We consider only those arguments from IGE with which we have agreed or on which we have relied.

[8] IGE presented on appeal various arguments from the specification in support of the positions that a home is a “point of sale location” and that a hard disk is a “material object.” Appellees assert that these arguments were waived. We conclude that these arguments are consistent with IGE's binding definitions. That is, these arguments neither narrow nor broaden the binding definitions. As we explained earlier, IGE's binding definition of a “point of sale location” does not preclude a home.

Similarly, a hard drive, which we take to be synonymous for present purposes with hard disk, is specifically mentioned in IGE's "simple definition" for a "material object" and is within the broad sweep of the specification passage identified by IGE as defining "material object." Accordingly, we hold that IGE has not waived these arguments.

The petitioning appellees further assert in their combined petition for rehearing that IGE has impermissibly presented additional arguments on appeal, based on the specification, with respect to: (1) a point of sale location *not* requiring at least two blank material objects and *not* requiring blank material objects to be available to consumers as blanks; (2) a material object *not* needing to be intended for use at the point of sale location; (3) an authorization code *not* needing to provide decoding information; (4) the Master File Unit and the Reproduction Unit *not* needing to contain certain detailed attributes, and the IMM *not* needing four separate and distinct components and *not* needing to communicate with an ICM; and (5) the steps of claim 1 *not* needing to be performed in order. It should be clear from our earlier analysis, and we so conclude, that each of these arguments is in further support of, and consistent with, IGE's binding claim construction. That is, each of these arguments is attempting to protect the original breadth of IGE's binding claim construction by rejecting the imposition of an additional limitation not required or recited by IGE's binding claim construction. We have indicated IGE's attempt to protect its original position by repeatedly using and emphasizing the word "not" above. Indeed, petitioning appellees have not asserted that any of IGE's arguments reflects a position that is inconsistent with IGE's binding claim construction. Accordingly, we hold that IGE has not waived these arguments.

Petitioning appellees also object to IGE's arguments that real-time delivery is disclosed in the specification. However, these arguments are not foreclosed to the extent they are used to support IGE's binding claim construction. Because IGE's binding definitions encompassed real-time delivery, these arguments are not waived.²

The petitioning appellees also assert that IGE impermissibly presented a new argument that the term "authorization code" be given its broadest scope and meaning. We understand IGE's statement merely to assert that the claim term "authorization code" was not given its proper construction. We note that IGE's specific argument, explaining the district court's error in reading limitations into the claim term, was addressed earlier. We do not interpret this additional statement as another argument. Accordingly, the doctrine of waiver is inapplicable.

Various appellees further assert that three additional categories of IGE arguments should be deemed to have been waived. The first category consists of IGE's alleged arguments that the terms "point of sale location," "material object," "information manufacturing machine," and "authorization code" are clear on their face and do not require resort to the specification. Because resort to the specification is always necessary, at least to determine if the patentee has redefined the claim terms, we consider this category of IGE's arguments to clearly lack legal merit and we have neither agreed with nor relied on them. The second category consists of IGE's claim differentiation arguments for "real-time transactions"

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and "authorization code." These arguments were not considered and have not been relied on. The third category consists of IGE's alleged claim constructions for the four additional claim limitations of "information control machine," "catalog code," "request reproduction code," and "source." IGE does not suggest that these limitations are now in dispute so we have not treated these constructions as being before us. Accordingly, we have neither agreed with them nor relied on them. As a result, we need not address waiver with respect to any of the above arguments.

4.

Applying the doctrine of judicial estoppel, IGE is precluded from changing its claim construction

position on appeal from any position that it successfully advanced at the district court. The petitioning appellees, however, do not allege that IGE succeeded at trial and then reversed its position, and we perceive no such infraction. Accordingly, we hold that IGE is not judicially estopped from making any of its arguments.

CONCLUSION

We hold that the district court erred in at least one aspect of its construction of each of the five claim limitations upon which the judgment of noninfringement was based. Accordingly, we vacate and remand for further proceedings consistent with the claim construction provided in this opinion.

VACATED AND REMANDED

Footnotes

¹ Dictionaries, which are a form of extrinsic evidence, hold a special place and may sometimes be considered along with the intrinsic evidence. *Cybor*, 138 F.3d at 1459, 46 USPQ2d at 1177; *Vitronics*, 90 F.3d at 1584 n.6, 39 USPQ2d at 1578 n.3 (stating that, although technically extrinsic evidence, the court is free to consult dictionaries at any time to help determine the meaning of claim terms, “so long as the dictionary definition does not contradict any definition found in or ascertained by a reading of the patent documents”).

² The district court recognized that IGE's binding definitions encompassed real-time delivery. See *Interactive Gift Express*, 47 USPQ2d at 1801 (“[IGE] argues that defendants, by offering computer software and documents for sale via the Internet ... are ... infringing”).

- End of Case -

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FULL TEXT OF CASES (USPQ2D)

All Other Cases

Johnson Worldwide Associates Inc. v. Zebco Corp. (CA FC) 50 USPQ2d 1607 (4/27/1999)

Johnson Worldwide Associates Inc. v. Zebco Corp. (CA FC) 50 USPQ2d 1607

Johnson Worldwide Associates Inc. v. Zebco Corp.

U.S. Court of Appeals Federal Circuit

50 USPQ2d 1607

Decided April 27, 1999

No. 98-1331

Headnotes

PATENTS

1. Patent construction -- Claims -- Broad or narrow (§ 125.1303)

Patent construction -- Claims -- Defining terms (§ 125.1305)

Term "heading," in claim for trolling motor autopilot device, has not been given particular meaning by patentee that limits it to direction of trolling motor itself, since many uses of term throughout patent are consistent with broader definition encompassing directions of both boat and trolling motor unit, since varied use of disputed term in written description demonstrates breadth of term, rather than providing limited definition, and since statements in prosecution history that were directed to claims not presently at issue do not limit scope of term as used in asserted claim.

2. Patent construction -- Claims -- Broad or narrow (§ 125.1303)

Patent construction -- Claims -- Defining terms (§ 125.1305)

Term "coupled," in phrase "heading lock coupled to a trolling motor" found in preamble of claim for

trolling motor autopilot device, has not been given particular meaning by patentee that limits it to mechanical or physical coupling, since mere inferences drawn from description of embodiment of invention cannot serve to limit claim terms, as they are insufficient to require narrower definition of disputed term, and since statements in prosecution history that were directed to claims not presently at issue do not limit scope of term as used in asserted claim.

3. Patentability/Validity -- Specification -- Written description (§ 115.1103)

Asserted claim of patent for trolling motor autopilot device is not rendered invalid for violation of written description requirement of 35 U.S.C. Section 112 if claim term "heading" is construed to encompass both direction of trolling motor and direction of boat, since term is used interchangeably throughout written description to refer both to direction of trolling motor and direction of boat, and

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since disclosure thus provides ample support for breadth of "heading" term, and does not unambiguously limit its meaning to direction of motor.

4. Patentability/Validity -- Anticipation -- Prior sale -- In general (§ 115.0707.01)

Patentability/Validity -- Specification -- Written description (§ 115.1103)

Infringement defendant has failed to show that claims of patent for trolling motor autopilot device are rendered invalid by on-sale bar of 35 U.S.C. Section 102(b) if construed broadly enough to cover accused device, since defendant's position reduces to argument that claims violate written description requirement of 35 U.S.C. Section 112, and thus are not entitled to filing date of parent application, since written description of patent provides ample support for ordinary and accustomed meaning of disputed claim terms, and since claims as properly construed are therefore entitled to benefit of parent application's filing date.

Particular patents -- Electrical -- Trolling motor autopilot

5,202,835, Knight, trolling motor with heading lock, summary judgment holding claim 1 literally infringed and not invalid affirmed.

Case History and Disposition:

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Appeal from the U.S. District Court for the Western District of Wisconsin, Shabaz, C.J.

Action by Johnson Worldwide Associates Inc. against Zebco Corp. and Brunswick Corp. for patent infringement. From summary judgment of literal infringement, defendants appeal. Affirmed.

Attorneys:

David L. De Bruin and Kimberly C. Tate, of Michael Best & Friedrich, Milwaukee, Wis., for plaintiff-appellee.

Kenneth J. Jurek and Rosanne J. Faraci, of McDermott, Will & Emery, Chicago, Ill., for defendants-appellants.

Judge:

Before Mayer, chief judge, and Clevenger and Gajarsa, circuit judges.

Opinion Text

Opinion By:

Clevenger, J.

Zebco Corporation and Brunswick Corporation appeal a summary judgment of patent infringement granted in favor of Johnson Worldwide Associates by the United States District Court for the Western District of Wisconsin. *See Johnson Worldwide Assocs., Inc. v. Zebco Corp.*, No. 97-C-453-S, slip op. at 19 (W.D. Wis. Apr. 2, 1998). Because the district court correctly construed the claims of the patent at issue and properly found no genuine issues of material fact regarding whether the patent was infringed, we affirm.

I

Johnson Worldwide Associates ("Johnson") is the holder of U.S. Patent No. 5,202,835 ("the '835 patent"), entitled "Trolling Motor With Heading Lock," which issued on December 15, 1992. 1 The '835 patent is generally directed to a steering control apparatus for small outboard motors, such as electric trolling motors. Trolling motors are an alternate propulsion source for small watercraft, generally intended for use while actively fishing--when the noise, vibration, and speed caused by larger or more powerful motors would diminish the chances of enticing fish to the proffered bait.

A

In broad terms, the invention of the '835 patent is a form of autopilot, described in the patent as a "heading lock," enabling directional control over the watercraft to be maintained without constant manipulation of trolling motor controls. The preferred embodiment of the '835 patent, as set forth in the written description and figures, employs a compass mounted to the head of the "heading lock" unit, which monitors the direction of the thrust motor, specifically noting that the direction of the thrust motor is considered to be the same as the direction of the boat, as the trolling motor is mounted on the bow of the boat. *See* '835 patent, col. 4, lines 48-51. Claim 1 of the '835 patent, the only independent claim alleged to be infringed, provides as follows:

1. A heading lock coupled to a trolling motor producing a thrust disposed to pull a watercraft, said heading lock comprising:
a steering motor coupled to said trolling motor, said steering motor being disposed

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to affect the orientation of said trolling motor in response to input signals;
a steering circuit electrically coupled to said steering motor, said steering circuit [being] disposed to generate said input signals to said steering motor in response to heading signals; and
a heading detector electrically coupled to said steering circuit, said heading detector being disposed to transmit said heading signals to said steering circuit.

Zebco Corporation and Brunswick Corporation (collectively, "Zebco") sell a product under the trade

name "AutoGuide" that maintains directional control of a trolling motor by use of a magnetometer located in a foot pedal. The foot pedal also contains the user controls. A microprocessor in the foot pedal sends steering signals to the steering motor through wires connecting the foot pedal to the trolling motor unit. The location of the magnetometer (in the foot pedal) is thus distinct from the location of the compass (fixed to the trolling motor head) depicted in the preferred embodiment of the '835 patent. Whether this fact is sufficient for Zebco to escape infringement of the '835 patent is the subject of this appeal.

B

In 1997, Johnson filed suit against Zebco, alleging, *inter alia*, that the AutoGuide unit infringed the claims of the '835 patent. The parties presented cross-motions for summary judgment on patent infringement in early 1998. On April 2, 1998, the district court agreed with Johnson's proffered claim construction, granted Johnson's motion for summary judgment of infringement, and denied Zebco's motions. The court held that there was nothing in the intrinsic evidence of the '835 patent that compelled or supported the narrow construction of the disputed terms in the claims urged by Zebco, namely that the term "heading" in "heading signal" was limited to the direction of the trolling motor, and that the term "coupled" in "heading lock coupled to a trolling motor" was limited to a mechanical or physical connection. Without these limitations, on stipulated facts, the district court found that each element of the construed claim was literally present in Zebco's AutoGuide device. This appeal followed, vesting this court with jurisdiction pursuant to 28 U.S.C. Section 1295(a)(1) (1994).

II

We review the grant of a summary judgment *de novo*. See *Conroy v. Reebok Int'l, Ltd.*, 14 F.3d 1570, 1575, 29 USPQ2d 1373, 1377 (Fed. Cir. 1994). In doing so, we must keep in mind that summary judgment is appropriate only if there is no genuine issue of material fact. See Fed. R. Civ. P. 56(c). To this end, the court must draw all reasonable factual inferences in favor of the nonmovant. See *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 255 (1986).

An infringement analysis is a two-step process in which the court first determines, as a matter of law, the correct claim scope, and then compares the properly-construed claim to the accused device to determine, as a matter of fact, whether all of the claim limitations are present, either literally or by a substantial equivalent, in the accused device. See *Renishaw PLC v. Marposs Societa Per Azioni*, 158 F.3d 1243, 1247-48, 48 USPQ2d 1117, 1120 (Fed. Cir. 1998); *General Mills, Inc. v. Hunt-Wesson, Inc.*, 103 F.3d 978, 981, 41 USPQ2d 1440, 1442 (Fed. Cir. 1997); *Young Dental Mfg. Co. v. Q3 Special Prods., Inc.*, 112 F.3d 1137, 1141, 42 USPQ2d 1589, 1592 (Fed. Cir. 1997). Because the relevant aspects of the accused device's structure and operation are undisputed in this case, the question of whether Zebco's AutoGuide product infringes the claims of Johnson's '835 patent turns on the interpretation of those claims. See *Athletic Alternatives, Inc. v. Prince Mfg., Inc.*, 73 F.3d 1573, 1578, 37 USPQ2d 1365, 1370 (Fed. Cir. 1996) ("Where, as here, the parties do not dispute any relevant facts regarding the accused product but disagree over [claim interpretation], the question of literal infringement collapses to one of claim construction and is thus amenable to summary judgment."). As we alluded to above, the crux of Zebco's argument is that the '835 patent covers only those trolling motor-autopilot systems that include a compass or other directional indicator physically attached to the trolling motor. Zebco arrives at this conclusion by the following route: (1) Zebco considers the "heading lock" invention of the '835 patent to be concerned only with the direction and orientation of the trolling motor rather than the boat; and (2) therefore the heading lock--which, according to claim 1, includes a heading detector "disposed to transmit . . . heading signals"--must be physically attached to the trolling motor. Because the accused AutoGuide systems undisputedly contain a directional indicator (a "heading detector") in a foot pedal--attached to the trolling motor via wires rather than mechanically--Zebco argues that Johnson's infringement claim must fail.

While Zebco recognizes that claim 1, the broadest claim at issue, does not explicitly require that the "heading detector" be mechanically coupled to the trolling motor, it nonetheless suggests that a proper interpretation of the terms "heading signal" and "coupled" in the language of claim 1 compels such a limited claim scope. In doing so, Zebco points out that Figure 1 of the '835 patent, and at least some of the language in the written description, suggest that the preferred embodiment of the invention includes a compass mechanically attached to the trolling motor. This case, then, presents the question of when it is permissible to narrow the scope of broad claim language by reference to embodiments described and depicted in the balance of the specification.

A

We begin, as with all claim interpretation analyses, with the language of the claims. See *Renishaw*, 158 F.3d at 1248, 48 USPQ2d at 1120; *Abtox, Inc. v. Exitron Corp.*, 122 F.3d 1019, 1023, 43 USPQ2d 1545, 1548 (Fed. Cir. 1997); *Bell Communications Research, Inc. v. Vitalink Communications Corp.*, 55 F.3d 615, 619-20, 34 USPQ2d 1816, 1819 (Fed. Cir. 1995). The general rule is, of course, that terms in the claim are to be given their ordinary and accustomed meaning. See *Renishaw*, 158 F.3d at 1249, 48 USPQ2d at 1121; *York Prods., Inc. v. Central Tractor Farm & Family Ctr.*, 99 F.3d 1568, 1572, 40 USPQ2d 1619, 1622 (Fed. Cir. 1996). General descriptive terms will ordinarily be given their full meaning; modifiers will not be added to broad terms standing alone. See, e.g., *Virginia Panel Corp. v. MAC Panel Co.*, 133 F.3d 860, 865-66, 45 USPQ2d 1225, 1229 (Fed. Cir. 1997) (unmodified term "reciprocating" not limited to linear reciprocation); *Bell Communications*, 55 F.3d at 621-22, 34 USPQ2d at 1821 (unmodified term "associating" not limited to explicit association); *Specialty Composites v. Cabot Corp.*, 845 F.2d 981, 987, 6 USPQ2d 1601, 1606 (Fed. Cir. 1988) (unmodified term "plasticizer" given full range of ordinary and accustomed meaning). In short, a court must presume that the terms in the claim mean what they say, and, unless otherwise compelled, give full effect to the ordinary and accustomed meaning of claim terms. See, e.g., *Nike Inc. v. Wolverine World Wide, Inc.*, 43 F.3d 644, 646, 33 USPQ2d 1038, 1039 (Fed. Cir. 1994); *E.I. Du Pont De Nemours & Co. v. Phillips Petroleum*, 849 F.2d 1430, 1433, 7 USPQ2d 1129, 1131 (Fed. Cir. 1988); *Envirotech Corp. v. Al George, Inc.*, 730 F.2d 753, 759, 221 USPQ 473, 477 (Fed. Cir. 1984).

In order to overcome this heavy presumption in favor of the ordinary meaning of claim language, it is clear that "a party wishing to use statements in the written description to confine or otherwise affect a patent's scope must, at the very least, point to a term or terms in the claim with which to draw in those statements." *Renishaw*, 158 F.3d at 1248, 48 USPQ2d at 1121. That is, claim terms cannot be narrowed by reference to the written description or prosecution history unless the language of the claims invites reference to those sources. See, e.g., *McCarty v. Lehigh Valley R.R.*, 160 U.S. 110, 116 (1895) ("[I]f we once begin to include elements not mentioned in the claim in order to limit such claim . . . , we should never know where to stop."); *Renishaw*, 158 F.3d at 1249, 48 USPQ2d at 1121. In other words, there must be a textual reference in the actual language of the claim with which to associate a proffered claim construction.

Our case law demonstrates two situations where a sufficient reason exists to require the entry of a definition of a claim term other than its ordinary and accustomed meaning. The first arises if the patentee has chosen to be his or her own lexicographer by clearly setting forth an explicit definition for a claim term. See *In re Paulsen*, 30 F.3d 1475, 1480, 31 USPQ2d 1671, 1674 (Fed. Cir. 1994); *Intellicall, Inc. v. Phonometrics, Inc.*, 952 F.2d 1384, 1387-88, 21 USPQ2d 1383, 1386 (Fed. Cir. 1992); *Lear Siegler, Inc. v. Aeroquip Corp.*, 733 F.2d 881, 888-89, 221 USPQ 1025, 1031 (Fed. Cir. 1984). The second is where the term or terms chosen by the patentee so deprive the claim of clarity that there is no means by which the scope of the claim may be ascertained from the language used. See *Eastman Kodak Co. v. Goodyear Tire & Rubber Co.*, 114 F.3d 1547, 1554, 42 USPQ2d 1737, 1741 (Fed. Cir. 1997) (looking past claim language because of lack of clarity), *overruled on other grounds* by *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 46 USPQ2d 1169 (Fed. Cir. 1998) (*en banc*);

J.T. Eaton & Co. v. Atlantic Paste & Glue Co. , 106 F.3d 1563, 1568, 41 USPQ2d 1641, 1646 (Fed. Cir. 1997) (Because "[the disputed claim term] is a term with no previous meaning to those of ordinary skill in the prior art[,] [i]ts meaning, then, must be found [elsewhere] in the patent."); *North Am. Vaccine, Inc. v. American Cyanamid Co.* , 7 F.3d 1571, 1576, 28 USPQ2d 1333, 1336 (Fed. Cir. 1993) (using the specification for guidance "[w]hen the

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meaning of a claim term is in doubt"); *E.I. Du Pont De Nemours* , 849 F.2d at 1433, 7 USPQ2d at 1131 (Fed. Cir. 1988) (the written description can supply understanding of unclear claim terms, but should never trump the clear meaning of claim terms). Cf. *Comark Communications, Inc. v. Harris Corp.* , 156 F.3d 1182, 1187, 48 USPQ2d 1001, 1005 (Fed. Cir. 1998) ("In this case, the [disputed term] has a clear and well-defined meaning. This term is not so amorphous that one of skill in the art can only reconcile the claim language with the inventor's disclosure by recourse to the specification."). In these two circumstances, a term or terms used in the claim invites--or indeed, requires--reference to intrinsic, or in some cases, extrinsic, evidence, see *Vitronics Corp. v. Conceptiontronic, Inc.* , 90 F.3d 1576, 1583, 39 USPQ2d 1573, 1577 (Fed. Cir. 1996) (reference to extrinsic evidence is proper when intrinsic evidence cannot resolve ambiguity in claim language), to determine the scope of the claim language.

B

Here, Zebco's primary claim interpretation argument is that the term "heading" in the phrase "heading signal" refers *only* to the direction of the trolling motor, thus requiring that the heading detector, "being disposed to transmit said heading signals," must be affixed to the trolling motor. Zebco, of course, recognizes that the ordinary and accustomed meaning of "heading" connotes only direction, rather than being limited to the direction of the trolling motor. Thus Zebco argues, as it must, for a more limited scope of "heading," to overcome the presumption in favor of the ordinary--and, in this case, broader--meaning.

[1] Because Zebco does not suggest that the phrase "heading signal" lacks clarity as it is used in the claim, in order to establish a reason to import a narrow definition of the term, it must instead argue that the term "heading" has been given a particular meaning by the patentee. To this end, Zebco argues that language throughout the written description and prosecution history of the '835 patent demonstrates that "heading" in the context of the '835 patent is limited to the direction of the trolling motor. We find this unpersuasive, as did the district court. First, the written description does not describe "with reasonable clarity, deliberateness, and precision" the definition of "heading" proposed by Zebco. See *In re Paulsen* , 30 F.3d at 1480, 31 USPQ2d at 1674. Indeed, the many uses of the term throughout the '835 patent are consistent with a broader definition, one encompassing the directions of both the boat and the trolling motor unit. Compare, e.g. , '835 patent, col. 3, lines 58-62 ("The electronic steering system of the present invention continues to monitor the current *heading of the thrust motor*" (emphasis added)) with '835 patent, col. 7, lines 37-39 ("Heading detector 204 continuously monitors the current *heading of the boat*" (emphasis added)). Varied use of a disputed term in the written description demonstrates the breadth of the term rather than providing a limited definition. See , e.g. , *Enercon GmbH v. International Trade Comm'n* , 151 F.3d 1376, 1385, 47 USPQ2d 1725, 1731-32 (Fed. Cir. 1998) (refusing to limit a term used "interchangeably" in the written description to only one of the uses of the term). That the term "heading" is used at various points in the written description to refer to both the direction of the trolling motor and the boat is simply not "a special and particular definition created by the patent applicant," *Renishaw* , 158 F.3d at 1249, 48 USPQ2d at 1121, and is thus an insufficient reason to limit the scope of the term.

Contrary to Zebco's arguments, *Laitram Corp. v. Morehouse Industries, Inc.* , 143 F.3d 1456, 46 USPQ2d 1609 (Fed. Cir. 1998), is inapposite. The court there held that a narrow interpretation of a disputed term was compelled because of statements in the written description that made clear that "the

asserted claims will bear *only one* interpretation: that the 'driving surface' limitation is limited to flat driving surfaces," and that the " 'driving surface' limitation . . . requires flat driving surfaces." *Id.* at 1463, 46 USPQ2d at 1614-15 (emphasis added). Here, of course, there is no such unambiguous language in the written description; nothing suggests that "heading" is required to be the heading of the trolling motor. *Cf. id.*

Zebco also argues that the patentee ascribed a special meaning to the term "heading" in the prosecution history. *See, e.g., Spectrum Int'l, Inc. v. Sterilite Corp.*, 164 F.3d 1372, 1378, 49 USPQ2d 1065, 1068-69 (Fed. Cir. 1998) (explicit meanings given to claim terms in order to overcome prior art will limit those terms accordingly); *Southwall Techs., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1576, 34 USPQ2d 1673, 1676 (Fed. Cir. 1995); *Standard Oil Co. v. American Cyanamid Co.* 774 F.2d 448, 452, 227 USPQ 293, 296 (Fed. Cir. 1985). In particular, Zebco argues that the applicant's statement, in a June 17, 1992 amendment to the '586 application, that "the heading signal . . .

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is dependent solely on the heading of the motor, and totally independent of the orientation of the vessel" is a clear definition of "heading signal" as being limited to the direction of the thrust motor. However, Zebco overlooks the fact that the claims referred to in that passage, claims 4 and 14 of the '586 application, expressly included an additional limitation: that the compass be "in a substantially fixed relationship to said propulsion device," (claim 4) or likewise "in a predetermined relationship with said propulsion device" (claim 14). The argument referenced by Zebco was unquestionably focused on the requirement, *in those claims*, that the compass be attached to the trolling motor. The patentee's suggestion that, where the "substantially fixed relationship" or "in a predetermined relationship" claim limitation was present, the feedback signal (*i.e.*, the heading signal) was dependent on the heading of the motor sheds no light on the meaning of "heading signal" in claims where that very limitation is not present. Rather, this exchange is an example of how carefully-crafted arguments in support of patentability can avoid creating ambiguous or adverse prosecution history. By stating clearly and particularly that the context of his remarks was in regards to claims 4 and 14, the applicant ensured that those of ordinary skill in the art--as well as courts, if need be--could evaluate the import and scope of his statements. Thus, because this argument was plainly limited to claims including a "fixed" or "predetermined" relationship between the compass and the trolling motor, it cannot be said to be a clear statement limiting the scope of "heading signal" in general. Zebco thus has not shown that sufficient reasons exist to import a limited definition of this term into the clear language of the claim. We therefore agree with the district court that the ordinary and accustomed meaning of "heading signal" controls.

C

[2] Zebco's second interpretive argument is that the term "coupled" in the phrase "[a] heading lock coupled to a trolling motor" found in the preamble of claim 1 is limited to a mechanical or physical coupling. We are unpersuaded. Even assuming--as did the district court and Zebco--that the language of the preamble of claim 1 constitutes limitations on the claim rather than mere description, *see Bell Communications*, 55 F.3d at 620, 34 USPQ2d at 1820 (Fed. Cir. 1995) (" [W]hen the claim drafter chooses to use both the preamble and the body to define the subject matter of the claimed invention, the invention so defined, and not some other, is the one the patent protects."), Zebco cannot demonstrate that a limitation to the broad and general term "coupled" must be read into the claim.

As with "heading signal," Zebco (a) recognizes that the unmodified term "coupled" generically describes a connection, and does not require a mechanical or physical coupling; and (b) does not suggest that "coupled," as used in the preamble, lacks clarity. Instead, Zebco points to passages of the written description implying the relationship between elements of the preferred embodiment, and argues that such language constitutes a special (and limited) definition of "coupled." For example, Zebco argues that the phrase "feedback means for providing a feedback signal to the control means, wherein

the feedback signal is indicative of the direction of thrust," '825 patent, col. 2, lines 32-34, defines "coupled" to mean "mechanically coupled." However, just as the preferred embodiment itself does not limit claim terms, *see Renishaw*, 158 F.3d at 1248, 48 USPQ2d at 1120, mere inferences drawn from the description of an embodiment of the invention cannot serve to limit claim terms, *e.g.*, *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1571, 7 USPQ2d 1057, 1064 (Fed. Cir. 1988), as they are insufficient to require a narrower definition of a disputed term.

Zebco also identifies statements in the prosecution history which purport to indicate the true (and limited) meaning of "coupled." Specifically, Zebco points to the aforementioned June 17, 1992 amendment of the '586 application, where the applicant argued that "it is not obvious to affix a compass to a propulsion device in a matter recited by [the] claims." However, as we noted above, that statement lends no support to Zebco's position, as it was made in reference to original claims 4 and 14, each of which expressly required that the compass be fixed to the trolling motor.

Because Zebco has not shown a sufficient reason to alter the clear meaning of the term "coupled," we agree with the district court that the term is not limited to a mechanical or physical coupling.

III

As alternatives to its claim construction arguments, Zebco next asserts that the relevant claim of the '835 patent, as construed by the district court (and now this court),

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violates the written description requirement of 35 U.S.C. Section 112, Para. 1, and the on-sale bar of 35 U.S.C. Section 102(b). These arguments, however, break no new ground, as they essentially repeat Zebco's claim interpretation position that we considered and rejected above.

A

[3] According to 35 U.S.C. Section 112, Para. 1 (1994), a patent specification must contain a written description of the invention sufficient to "allow persons of ordinary skill in the art to recognize that [the inventor] invented what is claimed." *See, e.g., Gentry Gallery, Inc. v. Berkline Corp.*, 134 F.3d 1473, 1479, 45 USPQ2d 1498, 1503 (Fed. Cir. 1998) (quoting *In re Gosteli*, 872 F.2d 1008, 1012, 10 USPQ2d 1614, 1618 (Fed. Cir. 1989)). Zebco argues that claim 1 of the '835 patent violates this requirement because, in its mind, the written description of the patent speaks of "heading" only in terms of the direction of the trolling motor, and that therefore any construction of "heading signal" encompassing both the direction of the trolling motor and the direction of the boat renders the patent invalid under section 112, Para. 1. *E.g., Gentry Gallery*, 134 F.3d at 1480, 45 USPQ2d at 1503-04 (finding that the written description did not support the breadth of the claims asserted by the patentee). As we noted above, however, the term "heading" is used interchangeably throughout the written description to refer to both the direction of the trolling motor and the direction of the boat. *Compare, e.g., '835 patent*, col. 3, lines 58-62 ("The electronic steering system of the present invention continues to monitor the current *heading of the thrust motor*" (emphasis added)) *with '835 patent*, col. 7, lines 37-39 ("Heading detector 204 continuously monitors the current *heading of the boat*" (emphasis added)). Thus, this case is unlike *Gentry Gallery*, in which this court's determination that the patent disclosure did not support a broad meaning for the disputed claim terms was premised on clear statements in the written description that described the location of a claim element--the "control means"--as "the only possible location" and that variations were "outside the stated purpose of the invention." *Gentry Gallery*, 134 F.3d at 1479, 45 USPQ2d at 1503. *Gentry Gallery*, then, considers the situation where the patent's disclosure makes crystal clear that a particular (*i.e.*, narrow) understanding of a claim term is an "essential element of [the inventor's] invention." *Id.*, 45 USPQ2d at 1503. Here, however, the patent disclosure provides ample support for the breadth of the term "heading"; it does not "unambiguously limit ["] the meaning of "heading" to the direction of the motor. *Cf. id.* at 1480, 45 USPQ2d at 1504. The district court did not err in ruling that the relevant claim of the '835 patent, as construed, was not invalid under 35 U.S.C. Section 112, Para. 1.

B

[4] Zebco's "on-sale bar" argument is essentially a reprise of its argument that the '835 patent is invalid under the written description requirement, and thus fares no better. Under 35 U.S.C. Section 102(b) (1994), a patent claim is invalid if the patented invention was "on-sale" or in public use in this country more than one year prior to the filing of the patent application from which the claim issued. *See* 35 U.S.C. Section 102(b); *Pfaff v. Wells Elecs., Inc.*, U.S. , 119 S.Ct. 304, 307, 48 USPQ2d 1641, 1642 (1998). Zebco's on-sale bar theory is that the '835 patent claims, if construed broadly enough to cover the accused device, are directed to subject matter not disclosed in the '586 application, and thus are not eligible for the filing date accorded that application. Under 35 U.S.C. Section 120, claims are granted the benefit of the filing date of an earlier-filed application only if the earlier application provides support according to 35 U.S.C. Section 112, Para. 1 for the later claims. *See* 35 U.S.C. Section 120 (1994); *Studiengesellschaft Kohle, m.b.H. v. Shell Oil Co.*, 112 F.3d 1561, 1564, 42 USPQ2d 1674, 1677 (Fed. Cir. 1997). Zebco posits that if the '835 patent is not entitled to the June 1990 filing date of the '586 application, then the invention of the '835 patent was on-sale or in public use more than one year before the July 1992 filing date of the '254 application, which matured into the '835 patent. 2 However, Zebco does not contend that the applicant impermissibly added new matter to the '254 application. *Cf.* 35 U.S.C. Section 132 (1994) ("No amendment shall introduce new matter into the disclosure of the invention."). Further, there is no dispute that the disclosures of the '586 and '254 applications--and thus the '324 and '835 patents, respectively--are the same in all but a few respects. 3 Zebco's position thus reduces to the argument that the claims of the '835

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patent violate the written description requirement of section 112, Para. 1. But to state the argument is to realize its objection; as we discussed above, the written description of the '835 patent provides ample support for the ordinary and accustomed meaning of the terms of the '835 claims. Thus, the '835 claims, as construed by the district court and this court, are entitled to the benefit of the filing date of the '586 application. No violation of section 102(b)'s on-sale bar has occurred.

IV

Zebco has failed to demonstrate to this court that the disputed claim terms of claim 1 of the '835 patent should be interpreted in a way other than their ordinary and accustomed meaning. Therefore, we find that the district court's claim interpretation, and the summary judgment of infringement conditioned thereon, was not erroneous. We also hold that the district court correctly determined that the relevant claim of the '835 patent, as construed, is not invalid. The judgment of the district court is affirmed.

AFFIRMED .

Footnotes

Footnote 1. The '835 patent issued from U.S. Patent Application No. 920,254 ("the '254 application"), filed on July 17, 1992, which was a continuation of U.S. Patent Application No. 537,586 ("the '586 application"), filed June 14, 1990. Johnson also holds U.S. Patent No. 5,172,324 ("the '324 patent"), entitled "Electronic Steering System," which matured from the '586 application but is not at issue in this case.

Footnote 2. Johnson does not dispute that products embodying the '835 invention were on sale more than one year prior to the filing of the '254 application in July 1992.

Footnote 3. The titles and abstracts are different, for example.

- End of Case -

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FULL TEXT OF CASES (USPQ2D)

All Other Cases

J.T. Eaton & Co. v. Atlantic Paste & Glue Co. (CA FC) 41 USPQ2d 1641 (2/11/1997)

J.T. Eaton & Co. v. Atlantic Paste & Glue Co. (CA FC) 41 USPQ2d 1641

J.T. Eaton & Co. v. Atlantic Paste & Glue Co.

U.S. Court of Appeals Federal Circuit
41 USPQ2d 1641

Decided February 11, 1997
No. 95-1380

Headnotes

PATENTS

1. Patent construction -- Claims -- Defining terms (§ 125.1305)

Claim term in patent for mousetrap requiring use of pressure sensitive adhesive having "a plastic flow temperature above 120 degrees F." is properly construed as requiring adhesive to resist plastic flow when exposed for 24 hours to temperature of 120 degrees F. in both horizontal and vertical orientations, since limitation was term unknown to those of ordinary skill in art at time application was filed, and it therefore fell to applicants to provide precise definition, since record amply demonstrates that applicants intended their adhesive to withstand plastic flow at 120 degrees F. when vertically oriented, since their disclosures to examiner repeatedly stated that intention, as did their product testing, and since applicants thus gave meaning to limitation during prosecution history with tests for plastic flow in vertical as well as horizontal orientations.

2. Infringement -- Construction of claims (§ 120.03)

Judgment that accused mousetraps infringe patent claim requiring use of pressure sensitive adhesive material having "a plastic flow temperature above 120 degrees F." is reversed, since that claim limitation, as properly construed, requires adhesive to resist plastic flow when exposed for 24 hours to temperature of 120 degrees F. in both horizontal and vertical orientations, and since there is no evidence in trial record that accused products resist plastic flow if subjected to 120 degrees F. in horizontal orientation.

3. Patentability/Validity -- Construction of claims (§ 115.03)

Patentability/Validity -- Obviousness -- Commercial success (§ 115.0908)

Infringement plaintiff failed to demonstrate presumptive nexus between mousetrap invention of patent and commercial success of its mousetrap product, since plaintiff's primary showing of commercial success seems limited to sales of its product which satisfies tests intended to show that product meets claim limitation requiring use of pressure sensitive adhesive material having "a plastic flow temperature above 120 degrees F.", since tests do not correctly define that limitation, and since test results therefore do not show that successful product is invention disclosed and claimed in patent; issue of nexus should be reexamined on remand, however, since results of other tests in evidence suggest that certain of plaintiff's products may embody claimed invention.

Particular patents -- General and mechanical -- Vermin trap

4,438,584, S. Baker and B. Baker, trap for rats, mice, and other vermin, judgment of infringement reversed, judgment that patent is not invalid vacated.

Case History and Disposition:

Page 1641

Appeal from the U.S. District Court for the Eastern District of New York, Amon, J.

Action by J.T. Eaton & Co. Inc. against Atlantic Paste & Glue Co. for patent infringement. From judgment that patent in suit is not invalid and that it is infringed by defendant's accused products, defendant appeals. Reversed in part, vacated in part, and remanded; Rader, J., dissenting in separate opinion.

Attorneys:

D. Peter Hochberg, Cleveland, Ohio, for plaintiff-appellee.

John M. Calimafde and Marvin N. Gordon, of Hopgood, Calimafde, Kalil & Judlowe and Bernard Malina, of Malina & Wolson, New York, N.Y., for defendant-appellant.

Judge:

Before Rich, Clevenger, and Rader, circuit judges.

Opinion Text

Opinion By:

Clevenger, J.

Atlantic Paste & Glue Company, Inc. (Atlantic) appeals the judgment of the United States District

Court for the Eastern District of New York holding that J.T. Eaton & Company, Inc.'s (Eaton) patent for a mousetrap is not invalid and is infringed by Atlantic's accused mousetraps.

For the reasons set forth below, we conclude that the district court misinterpreted claim 1 of Eaton's patent. Consequently, we reverse the judgment that the patent is infringed, and we vacate the judgment that the patent is not invalid under 35 U.S.C. Section 103 (1994). The case is remanded to the district court for further proceedings with regard to the validity issue.

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I

This suit involves United States Patent No. 4,438,584 (the '584 patent), issued on March 27, 1984, to Stanley Z. Baker and Benjamin H. Baker. The patent, assigned to Eaton, discloses a "Trap for Rats, Mice, and Other Vermin." Claim 1, the patent's only independent claim, reads, with emphasis added: A commercial trap product for catching mice or rats comprised of a generally flat support formed of a non-porous, thin sheet material, said support having at least one positioning surface, at least one indented portion having a given depth below said positioning surface, and a relatively thick layer of pressure sensitive adhesive material contained within said indented portion having a thickness of at least 1/16 inch, *a plastic flow temperature above 120 degrees F.* and an upper surface; said indented portion having a greater depth than the thickness of said layer of adhesive and said positioning surface being spaced above said adhesive layer upper surface.

Claim 1 thus recites a dishlike container holding a pressure sensitive adhesive material in which vermin become stuck, and thereby trapped. The commercial embodiments of the invention feature two plastic containers or traps, typically packaged together, one on top of the other, face-to-face, capable of being hung in a vertical position at the point of sale.

After a bench trial, the district court issued findings of fact and conclusions of law in which it interpreted the limitation, "a plastic flow temperature above 120 degrees F." Based on its interpretation, Atlantic's accused product was found to infringe claim 1. Additionally, the district court held claim 1 not invalid under Section 103 for obviousness, or under 35 U.S.C. Section 102(b) (1994) for having been on sale for more than one year before the filing date of the '584 patent. For the reasons set forth in the opinion of the district court, we hold that, on the facts presented in this case, claim 1 is not invalid under Section 102(b), and we thus refer no further to that issue.

Whether claim 1 is infringed by Atlantic's accused product, and whether Eaton's commercially successful product is an embodiment of the invention claimed (the latter being germane in this case to the validity of the patent under Section 103), depend on what is meant by "a plastic flow temperature above 120 degrees F." As we will explain below, the correct meaning of that term is established by reading the prosecution history of the '584 patent. That is a legal exercise which we are obligated to conduct independently. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979, 34 USPQ2d 1321, 1329 (Fed. Cir. 1995), *aff'd*, 116 S. Ct. 1384 [38 USPQ2d 1461] (1996).

II

The district court construed the limitation "a plastic flow temperature above 120 degrees F," with reference to the claimed adhesive, to mean:

[T]hat the adhesive has a flow characteristic which enables the trap product to be shipped and stored at the highest ambient temperature expected to be encountered in connection with such shipping and storage, namely 120 degrees F, without the adhesive flowing from the support.

A pressure sensitive adhesive material in a trap for catching mice or rats, in accordance with the invention in Eaton's '584 patent, has a plastic flow temperature above 120 degrees F if the adhesive passes the two tests established by Mr. Kenneth A. Nelson . . . , namely (1) disposing a support, such as a tray, and the adhesive therein in an inverted horizontal orientation on an underlying substrate and exposing the support and adhesive to a temperature of 120 degrees F for sixteen (16) hours, and (2)

disposing a support, such as a tray, and the adhesive therein in a vertical orientation on an underlying substrate and exposing the support and adhesive to a temperature of 77 degrees F for sixty-three (63) hours. An adhesive passes these tests and has a plastic flow temperature above 120 degrees F if the adhesive does not flow from the support onto the underlying substrate during the test. These two tests are set forth in the file history of Eaton's '584 patent.

In addition, the district court cited another test to determine if an adhesive has a plastic flow temperature above 120 degrees F. That test, devised by Findley Adhesives, Inc., called for heating the adhesive to 250 degrees F for one-half hour, allowing the adhesive to set at room temperature for 24 hours, then disposing the adhesive in an inverted horizontal orientation at a temperature of 120 degrees F for 16 hours. With regard to those tests, the district court held that:

The two tests devised by Mr. Nelson and the test procedure established by Findley Adhesives, Inc. are appropriate for determining that an adhesive has a plastic flow temperature of 120 degrees F in accordance with the invention claimed in the '584 patent.

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Based on undisputed testimony offered by Eaton, Atlantic's mousetraps -- when subjected to these tests -- were found to infringe claim 1. As we will explain below, however, these tests cannot, as a matter of law, be the measurement for determining if an adhesive meets the plastic flow temperature limitation of claim 1, because the tests do not measure plastic flow at 120 degrees F in a vertical orientation, which is required when the claim is properly construed.

After a thorough analysis of the prior art, the district court found the "primary indicia of patentability . . . lacking," *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 306, 227 USPQ 657, 675 (Fed. Cir. 1985), for claim 1, and that the claim would have been obvious when viewed in the light of the prior art and the level of skill in the art. Nevertheless, the district court held the patent nonobvious because of the strong commercial success of Eaton's commercial product. The finding of commercial success was based on Eaton's \$17 million of sales from 1979 through 1984, and its \$4 million of annual sales from 1985 through 1989.

III

The '584 patent emerged from claims originally set forth in Patent Application No. 338,621, which is a continuation of Ser. No. 53,381, filed on June 29, 1979. The examiner rejected the claims, *inter alia*, for failure to disclose the best mode of making the invention. The Nelson tests, used by the district court as the measurement of plastic flow temperature, assessed prior art adhesives and an adhesive which Nelson's employer, Findley Adhesives, had been requested by Eaton to prepare that would meet the limitations of claim 1. Even though Eaton had expressly directed Nelson to test the adhesives for plastic flow at 120 degrees F in an orientation other than horizontal, Nelson's test results did not refer to any tests or test results at 120 degrees F in a vertical orientation. Instead, the only 120 degrees F test performed by Nelson was on adhesive in a horizontal orientation. Nelson's tests for plastic flow in a vertical position at 77 degrees F were unrelated to the 120 degrees F plastic flow limitation in the '621 application, and were not requested by the performance specifications supplied to Nelson by Eaton. The results of Nelson's tests, as well as his test protocols, were introduced by the applicants to overcome the best mode rejection and to show that prior art adhesives failed to meet the Nelson tests.

The examiner, however, was troubled by the information disclosed in the Nelson tests. In particular, the examiner noted that one of the prior art adhesive traps tested by Nelson anticipated the claims under 35 U.S.C. Section 102 (1994). Accordingly, the examiner requested additional tests by Nelson from the applicants to overcome the rejection. Eaton's attorney communicated the examiner's concerns to Nelson by letter dated November 6, 1981, which was introduced at trial on the public record as Defendant's nonprivileged Exhibit 197. In that letter, Nelson was instructed by Eaton's counsel to perform

additional tests on the prior art adhesive. In particular, the attorney noted the need for a 120 degrees F test with the adhesive vertically oriented. The attorney recommended a vertical 120 degrees F test "for a period of a day or several days." Whether Nelson performed the particular vertical tests requested by Eaton's attorney is unknown, and the prosecution history of the '584 patent contains no reference to the results of such vertical tests. The examiner rejected the claims for failure to disclose best mode, nonenablement of the adhesive, and obviousness over the prior art.

On appeal to the Board of Appeals of the U.S. Patent and Trademark Office (Board), the claims were held not prima facie obvious over the prior art, and in any event not obvious because of the commercial success of Eaton's products. The applicants, in their brief to the Board, stated that the adhesive claimed must not flow when exposed to 120 degrees F in vertical orientation, even for unlimited periods of time. The requirement that the claimed adhesive not flow when exposed to 120 degrees F in a vertical orientation had been noted several times during prosecution up to the filing of the applicant's brief to the Board, and the same point was emphasized throughout subsequent prosecution proceedings. For example, the applicants stated in their brief to the Board:

Also importantly, the adhesive must have temperature-flow characteristics such that *even if the surface of the adhesive is vertical*, the adhesive will not flow or sag at ordinarily encountered ambient storage temperatures (less than 120 degrees F). That is to say, the plastic flow temperature of the adhesive must be above 120 degrees F. [Emphasis added.]

On another occasion, in its statement to the Patent Office dated November 19, 1985, the applicant distinguished prior art references on the basis that:

Nowhere in any of these references is there any mention whatsoever of a body of adhesive having a particular plastic flow temperature which enables a vermin trap to be shipped and stored in *positions other than horizontal* at the highest ambient

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temperature expected to be encountered in connection with such shipment and storage without the body of adhesive running from the support therefor. [Emphasis added.]

In sum, the prosecution history abounds with unambiguous declarations by the applicants that their claimed traps would reasonably be exposed to 120 degrees F when vertically oriented. That history is consistent with the evidence introduced at trial showing Eaton's repeated efforts to test adhesives at 120 degrees F in vertical orientations, and refutes any notion that Eaton's only vertical flow concerns were satisfied by Nelson's 77 degrees F vertical test. However, despite the applicants' repeated emphasis on the requirement that the adhesive not flow when exposed to 120 degrees F in a vertical orientation, the file history contained no reference to any vertical test at 120 degrees F when the '584 patent issued on March 27, 1984.

In July of 1985, a request for reexamination was filed by Hampton Chemical, Inc., based on several prior art references not previously considered by the examiner or the Board. For purposes of our review, two items of the prior art are of concern: two U.K. patents, disclosing an adhesive in a mousetrap, and a domestic adhesive product, Formula 31, which were said to render obvious the mousetrap claimed in the '584 patent.

IV

When the patent was subjected to reexamination, the applicants, Hampton Chemical, and the examiner knew that the invention as claimed specified that the adhesive not flow when exposed to 120 degrees F in any orientation, including vertical. However, before the reexamination proceedings, no reference had been made in the file history to any test of plastic flow at 120 degrees F when the material is vertically oriented. All previous references to plastic flow in a vertical orientation were with respect to relatively long-term exposure at ambient room temperatures. In particular, the earlier references to vertical plastic flow cited the Nelson tests, which exposed the adhesive to 77 degrees F for 63 hours. The concern over possible flow at room temperature after exposure for several days stemmed from the inventors'

understanding that at commercial points of sale, the packaged traps might remain suspended vertically for such times. The 77 degrees F test, while of interest to the inventors for shelf life marketability of their product, is irrelevant to the determination of whether an adhesive will flow when exposed to 120 degrees F for any period of time. In short, claim 1 of the '584 patent cannot be enforced against a mousetrap product with an adhesive which passes Nelson's 77 degrees F vertical test, but which fails the 120 degrees F test. Nor can a product which passes the 77 degrees F test, but which fails the 120 degrees F limitation, be used to demonstrate commercial success of the invention as part of a defense to legal challenge under Section 103.

Before reexamination, a competitor of Eaton wishing to avoid infringement of claim 1 would not have known how to test his product to determine if it satisfied the 120 degrees F limitation when the adhesive is vertically oriented. Indeed, such a competitor, Southern Mill Creek Productions Company, Inc., had already appeared, in protest to the application before the patent issued, complaining that "no where in the confines of this Application have Applicants defined how one might measure the flow temperature of the pressure-sensitive adhesive material." The applicants, however, took no steps to disclose a test protocol for measuring plastic flow at 120 degrees F in a vertical orientation. The record in this case reflects that Eaton learned in 1983, while Southern Mill's complaint was pending, and before issuance of the patent, that its own product failed the 120 degrees F flow test when exposed vertically for 16 hours. We do not know, however, whether that fact affected Eaton's failure to disclose a 120 degrees F vertical test protocol to the examiner.

V

During reexamination, Hampton Chemical sought to prove that Eaton's claimed mousetrap employing a special adhesive was rendered obvious in view of the two U.K. patents and Formula 31. To make its case, Hampton employed one of ordinary skill in the art, Donatas Satas, to test the adhesive disclosed in the U.K. patents. Satas selected the test protocol for the 120 degrees F limitation, and determined that the adhesive should be tested for flow at 120 degrees F for 24 hours in a vertical orientation, and for 12 hours at 120 degrees F in an inverted horizontal orientation. Satas concluded that the prior art adhesives so tested met the limitations of claim 1.

Eaton, also in the reexamination, sought to prove that Formula 31 did *not* meet the limitations of claim 1. Toward that end, Eaton hired John M. Questel, also one of ordinary skill in the art, to test Formula 31. Questel's tests were performed under his supervision by his employee, Lore Hise. The test protocol selected by Questel exposed the adhesive to 120 degrees F for 24 hours in both horizontal and vertical orientations. Questel

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concluded that Formula 31 did not meet the limitations of the claim, and that he lacked sufficient information to comment -- one way or another -- on the conclusion reached by Donatas Satas on the adhesive disclosed in the U.K. patents.

On March 10, 1986, the examiner rejected the claims on reexamination as obvious under Section 103 over the references brought to the examiner's attention by Hampton Chemical. Eaton responded to that rejection, arguing that Questel's tests had shown Formula 31 not to be invalidating prior art, and that Satas's test results were inconclusive. In its response, Eaton relied on the Questel tests, and notably, did not question the propriety of the test protocols employed by Satas. From this episode in the file history of the '584 patent, a reasonable competitor of Eaton would surmise that Eaton would measure satisfaction of "a plastic flow temperature above 120 degrees F" by testing accused adhesives at 120 degrees F for 24 hours in both vertical and horizontal orientations. In short, after seven years of patent application prosecution, the file history clearly supplied the missing vertical 120 degrees F test parameter and a corresponding horizontal test.

VI

The final chapter of the file history of the '584 patent is the second appeal to the Board following

another rejection of the claims by the examiner as obvious over the prior art, including the U.K. patents and Formula 31. Both Eaton and the examiner again relied on the Questel tests, with Eaton arguing the tests showed that the prior art failed to meet the 120 degrees F claim limitation, and the examiner arguing that the tests showed the prior art met the limitation. The Board, during the course of its detailed review of the prior art, relied on the 24-hour parameter in the Questel tests in concluding that the adhesive in Formula 31 met the 120 degrees F limitation. In light of the prior art, the Board concluded that the claims are prima facie obvious, but that the claims are nevertheless nonobvious under Section 103 because of the commercial success of Eaton's product, as demonstrated to the Board by Eaton's submission of sales data and consumer testimonials. During this final chapter of the prosecution history, neither Eaton, the examiner, nor the Board referred to the then-ancient Nelson tests as the protocol for ascertaining the meaning of the 120 degrees F claim limitation. Instead, there was unanimous recognition that the Questel test protocols were understood by one of ordinary skill in the art to define the 120 degrees F claim limitation.

VII

We now turn to the events at trial in the district court. Both Eaton and Atlantic offered testimony through expert witnesses about the meaning of the 120 degrees F claim limitation. "Plastic flow temperature above 120 degrees F" is a term with no previous meaning to those of ordinary skill in the art. Its meaning, then, must be found somewhere in the patent. See 35 U.S.C. Section 112, Para. 2 (1994) (inventor must particularly point out and distinctly claim the subject matter of his invention); *In re Paulsen*, 30 F.3d 1475, 1480, 31 USPQ2d 1671, 1674 (Fed. Cir. 1994) (inventor as lexicographer must define his terms in the patent disclosure). Both expert witnesses understood that the adhesive in claim 1 had to withstand plastic flow at 120 degrees F when subjected to horizontal and vertical tests. Both witnesses also understood that the claim prohibits plastic flow at 120 degrees F after the adhesive has been exposed to the specified degree of heat for such reasonable periods of time as the commercial product might experience during shipping and storage.

The experts, however, disagreed over the length of time that the patented product might remain exposed to 120 degrees F during shipping and storage. Eaton's expert, Richard Muny, testified regarding adhesive tests that he had been asked to run on Eaton's products and the accused products of Atlantic. Muny testified that he took no part in selecting the test protocols; instead, he simply ran his tests using protocols given to him by Findley Adhesives at the direction of Eaton. The tests used by Muny were those devised by Nelson (horizontal at 120 degrees F for 16 hours and vertical at 77 degrees F for 63 hours), plus a vertical test at 120 degrees F for 5 hours. Muny did not explain why he was asked to conduct the 120 degrees F vertical test. Muny also testified that it might go "too far" to describe these Findley tests as standard quality control procedure. Muny, however, testified that in his opinion the tests he had been asked to run reflected the time periods during which the products might be expected to be exposed to 120 degrees F when in shipment or storage.

Dr. Harold Zeliger testified that he had been retained by Atlantic to devise and carry out tests to demonstrate whether the products of Eaton and Atlantic met the limitations of claim 1. Zeliger read claim 1 to require the adhesive to resist plastic flow when exposed to 120 degrees F in a vertical orientation. Zeliger did not state whether he tested any product for plastic flow when in a horizontal orientation. His tests exposed six commercial products of both Eaton and Atlantic to 120 degrees F, vertically oriented in their

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packages of two trays facing one another. Zeliger periodically examined the products being tested to determine if they had experienced plastic flow. Zeliger concluded that an adhesive "failed," when the adhesive in the two trays flowed into each other. According to Zeliger's tests, two of Eaton's products resisted plastic flow for 44 hours, but the other four Eaton products "failed," or flowed, one after 11 hours and the other three after 20 hours. Of Atlantic's accused products, one failed after 24 hours, three

failed after 11 hours, and two failed after 20 hours.

Zeliger testified that, in his view, all of the products of Eaton and Atlantic failed during times he considered reasonable times when the adhesives would be exposed to 120 degrees F during shipping and storage. Zeliger expressly disagreed with Muny's conclusion that five hours of exposure at 120 degrees F was the reasonable maximum exposure time. Zeliger testified that a five-hour time limit was not indicative of real world conditions. On cross-examination, Zeliger admitted that in real world conditions, one would not find exact temperatures of 120 degrees F maintained evenly over periods of time. Zeliger thus cast some doubt on his own tests as effective measurements of actual shipping and storage conditions.

After hearing all the testimony, the district court rejected Zeliger's view that infringement of claim 1 should be measured by the length of time required for the adhesive in the trap to flow when exposed to 120 degrees F in a vertical position. The district court also rejected the portion of Muny's tests that had subjected Atlantic's traps to 120 degrees F in a vertical orientation for five hours. Instead, the district court held that Nelson's tests, as conducted by Muny, proved that Atlantic's product infringed claim 1. For the reasons explained above, the district court's reliance on the Nelson tests is legal error, since those tests fail to subject the claimed adhesive to 120 degrees F when vertically oriented.

If Muny is correct that his five-hour vertical test and a 16-hour horizontal test satisfy claim 1, Atlantic's accused product would infringe claim 1 because Atlantic apparently concedes the 16-hour, 120 degrees F horizontal measurement and Zeliger proves that at least some of Atlantic's product survives for five hours when tested vertically. If, however, Zeliger is correct that the reasonable times for exposure at 120 degrees F can vary, and that his failure times are all within a zone of reasonable exposure times, then none of Atlantic's product infringes claim 1. Eaton's own product also would not meet the limitations of claim 1, and Eaton would thus be unable to claim commercial success of that product to establish that claim 1 is not obvious under Section 103.

We may not rely on either Muny or Zeliger, because, as we have often stated, trial testimony regarding the meaning of a claim cannot vary the meaning of a claim that is established either by the claim itself or by the claim as correctly understood by reference to the specification and the file history. See *Senmed, Inc. v. Richard-Allen Medical Indus., Inc.*, 888 F.2d 815, 819 n.8, 12 USPQ2d 1508, 1512 n.8 (Fed. Cir. 1989); see also *North Am. Vaccine, Inc. v. American Cyanamid Co.*, 7 F.3d 1571, 1577, 28 USPQ2d 1333, 1337 (Fed. Cir. 1993) (patentee cannot take one position before the Patent Office and a different position before the court); *Jonsson v. Stanley Works*, 903 F.2d 812, 820-21, 14 USPQ2d 1863, 1871 (Fed. Cir. 1990) (same).

For the reasons set forth above, we have concluded that the district court erred, as a matter of law, when it construed the term "a plastic flow temperature above 120 degrees F" to exclude any amount of plastic flow when the adhesive is exposed to 120 degrees F in a vertical orientation. The 120 degrees F vertical tests proposed by Muny and Zeliger are also legally insufficient; Muny's because it sets the time for horizontal and vertical testing incorrectly, and Zeliger's because it sets no times for testing, but simply tests until failure, and then asks if the time to failure is within reasonable real world exposure times. While Zeliger's test may have some common sense appeal, it provides no certainty to Eaton's competitors, who are entitled to know the point in time at which their products will infringe claim 1. Nor does Zeliger's test give any measure of certainty to Eaton, which is also entitled to know in advance how to test competing product for infringement of claim 1.

[1] In this case, the dispositive claim limitation is a term unknown to those of ordinary skill in the art at the time the patent application was filed. It thus fell to the applicants, as a duty, to provide a precise definition for the 120 degrees F limitation. Early in the prosecution history of the '584 patent, a competitor noted the absence of any definition of the key term. The applicants' proffer of the Nelson tests did not respond properly to the competitor's plea, because the Nelson tests failed to supply a test parameter for flow at 120 degrees F when the adhesive is vertically oriented. The record in this case amply demonstrates that the applicants intended their adhesive to withstand plastic flow at 120 degrees F when vertically oriented. Their disclosures to the examiner repeatedly stated that intention, as did their

testing of products, demonstrated by evidence submitted at trial, for flow at 120 degrees F when vertically oriented. The applicants were obligated to give a meaning to the key limitation during the prosecution history, and they did so with the Questel tests.

VIII

Having concluded that "a plastic flow temperature above 120 degrees F" means that the adhesive must resist flow when exposed for 24 hours to 120 degrees F in both horizontal and vertical orientations, we now review the holdings of the district court that Atlantic's accused products infringe claim 1, and that the claims of the '584 patent are not invalid as obvious under Section 103.

A

[2] Zeliger's tests on Atlantic's product prove that at least one such product resisted plastic flow when exposed for 24 hours to 120 degrees F in a vertical orientation. There is no proof in the Zeliger tests, however, that the same product resisted plastic flow when exposed to 120 degrees F for 24 hours in a horizontal orientation. The Zeliger tests thus cannot serve as the factual basis to demonstrate that Atlantic's product infringes claim 1, as correctly interpreted. The burden rested with Eaton, throughout the trial, to prove that Atlantic's mousetraps met each limitation in claim 1. Eaton knew, from at least the final chapter of the prosecution history, that its claim required the adhesive to resist plastic flow when subjected to 120 degrees F in both vertical and horizontal orientations. Instead of testing Atlantic's product for infringement under the protocols disclosed in the prosecution history, Eaton erroneously sought to make its case on the basis of Nelson's 16-hour horizontal test and the 5-hour vertical test run by Muny. Having reviewed the trial record and found no evidence that Atlantic's product meets the 120 degrees F limitation as correctly interpreted, we have no choice but to reverse the district court's judgment of infringement.

B

Whether Eaton could succeed on its claim of infringement by Atlantic also depends on whether it can overcome Atlantic's challenge to the validity of the '584 patent. As noted above, the district court concluded that the '584 patent would have been invalid as obvious under Section 103 but for the commercial success that Eaton's products have enjoyed since their introduction to the marketplace. The district court carefully reviewed the prior art pursuant to which it reached that conclusion. That review repeated the review conducted by the Board in the second appeal, at the conclusion of which the Board also determined that but for the commercial success the claims in suit would have been invalid for obviousness. We need not repeat for a third time the analysis of the prior art, with which we agree. The only pertinent issue under Section 103 is whether the evidence of commercial success introduced at trial is legally sufficient to support the conclusion of the district court that the '584 patent would not have been obvious under Section 103.

Just as no product can infringe claim 1 unless the product resists plastic flow when exposed vertically and horizontally at 120 degrees F for 24 hours, Eaton cannot demonstrate commercial success, for purposes of countering the challenge of obviousness, unless it can show that the commercial success of the product results from the claimed invention. Furthermore, the asserted commercial success of the product must be due to the merits of the claimed invention beyond what was readily available in the prior art. *Richdel, Inc. v. Sunspool Corp.*, 714 F.2d 1573, 1580, 219 USPQ 8, 12 (Fed. Cir. 1983) (claims held obvious despite purported showing of commercial success when patentee failed to show that "such commercial success as its marketed system enjoyed was due to anything disclosed in the patent in suit which was not readily available in the prior art"). When a patentee can demonstrate commercial success, usually shown by significant sales in a relevant market, and that the successful product is the invention disclosed and claimed in the patent, it is presumed that the commercial success is due to the patented invention. *Demaco Corp. v. F. Von Langsdorff Licensing Ltd.*, 851 F.2d 1387,

1392-93, 7 USPQ2d 1222, 1226-27 (Fed. Cir. 1988). If a patentee makes the requisite showing of nexus between commercial success and the patented invention, the burden shifts to the challenger to prove that the commercial success is instead due to other factors extraneous to the patented invention, such as advertising or superior workmanship.

[3] At trial, Atlantic argued that Eaton's evidence of commercial success is legally insufficient, and, therefore, that the '584 patent is invalid for obviousness. The district court correctly noted that Eaton carries the burden of demonstrating that the "thing . . . that is commercially successful is the invention disclosed and claimed in the patent." *Demaco*, 851 F.2d at 1392, 7 USPQ2d at 1226. The significant sales of Eaton's

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"Stick-Em" glue traps were held by the district court to establish the requisite nexus because the adhesive "does not flow out of the trap but stays put to catch the vermin." In this case, Eaton's primary showing of commercial success seems limited to the sales of the Stick-Em product which satisfied the Nelson tests. Because the Nelson tests do not correctly define the 120 degrees F limitation in claim 1, they cannot serve to assist Eaton in making its nexus case. Zeliger's tests, however, suggest that certain of Eaton's products may embody the claimed invention, and for that reason, we conclude that the issue of nexus should be reexamined on remand. If Eaton can demonstrate that the commercial success of its product derives from the claimed invention and is attributable to something disclosed in the patent that was not readily available in the prior art, it is entitled, on the record in this case, to the presumption that the commercial success of its product is attributable to its patented invention.

At trial, the district court held that the volume of Eaton's sales satisfied the requirements to show commercial success. The district court also rejected the reasons advanced by Atlantic to prove that the commercial success was due to advertising and other factors, instead of resulting from the patented invention. We agree with the district court in these respects and affirm its decision that the sales evidence in this case shows success and that Atlantic's other explanations of success cannot overcome a properly grounded presumptive showing of nexus between the commercial success and the claimed invention. We disturb only the holding that Eaton proved a presumptive nexus between the sales of its product and the invention claimed.

On remand, Eaton will have an opportunity to renew its assertion that the commercial success of its product, as shown by the evidence introduced at trial, demonstrates the lack of obviousness of the '584 patent. Atlantic will have a corresponding opportunity to challenge Eaton's renewed assertion.

IX

Based on the correct interpretation of claim 1, the judgment of infringement is reversed, and the judgment that the '584 patent is not invalid under Section 103 is vacated. The case is remanded to the district court.

No costs.

REVERSED-IN-PART, VACATED- IN-PART, AND REMANDED .

Rader, J., dissenting.

Two inventors at J.T. Eaton & Company, Inc. (Eaton) built a better mousetrap and, as promised in the old adage, *the world beat a path to their door. In an effort to reap its rightful reward for advancing the state of the art, Eaton surmounted extensive legal hurdles. Eaton persevered through eight years of patent prosecution in the Patent and Trademark Office (PTO). After a competitor protest, two reexamination proceedings, and two appeals, the Board of Patent Appeals and Interferences (Board) twice confirmed the patentability of Eaton's invention. Thereafter, Eaton spent twelve years in district court proceedings, ultimately winning a judgment of infringement against its competitor, Atlantic Paste & Glue Company, Inc. (Atlantic). All this effort, however, came to naught when this court concocted its own novel interpretation of the lengthy prosecution history of Eaton's patent. Based on its reading of the administrative record, this court arrives at a claim interpretation that no party advocated throughout

the protracted history of this patent and is likely to cover neither Eaton's nor Atlantic's products. To reach its idiosyncratic claim interpretation, this court relies on a few isolated excerpts from over 1400 pages of prosecution history. In particular, this court abstracts two paragraphs from an eleven-page declaration of John M. Questel, filed in the second reexamination, to convert a stringent vertical flow test into a claim requirement. In fact,

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neither Eaton, nor the Board, nor even Mr. Questel himself, relied on his 120 degrees F vertical flow test to distinguish prior art. The administrative record, when considered as a whole, does not support this court's adoption of this test as the measure of Eaton's claims.

This court need not have strained to interpret the claims. The patent record -- the claims, specification, and prosecution history -- provides ample support for the claim interpretation adopted by the United States District Court for the Eastern District of New York. In fact, the examiner, the Board, and at least two federal judges have already accepted the same interpretation -- a reading compelled by the prosecution history as a whole.

I.

The phrase "plastic flow temperature" has no fixed meaning in the adhesive art. However, an inventor may freely define unfamiliar claim terms in the specification or in the prosecution history. See *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582, 39 USPQ2d 1573, 1576 (Fed. Cir. 1996); *Lear Siegler, Inc. v. Aeroquip Corp.*, 733 F.2d 881, 889-90, 221 USPQ 1025, 1031 (Fed. Cir. 1984). Eaton took that course to define its claim term.

Eaton's Patent No. 4,438,584 (the '584 patent) distinguished its ready-to-use glue trap for mice and rats from the prior art with an adhesive having a "plastic flow temperature above 120 degrees F." The inventors, Stanley and Benjamin Baker, recognized that the adhesives used in prior art traps would melt and flow at temperatures normally encountered during shipping and storage. The Bakers learned from the United States Department of Transportation that the maximum ambient temperature encountered during shipping was 120 degrees F. To solve the problem with the prior art, the Bakers set out to stabilize their adhesive at temperatures up to 120 degrees F. Thus, the requirements of secure shipping became the benchmark for "plastic flow temperature."

Throughout the lengthy administrative proceedings, Eaton and the PTO clarified this meaning of plastic flow temperature. For example, in its Amendment filed July 24, 1981, Eaton explained:

[B]ecause the plastic flow temperature is above 120 degrees F, the body of the adhesive will not flow plastically at normally encountered ambient temperatures while being shipped or stored. The traps can be disposed horizontally, upside down or vertically at normally encountered temperatures with no fear of touching of adjacent surfaces or the adhesive of one trap to the other.

Thus Eaton explained that its claimed adhesive would not flow upside-down or "vertically at normally encountered temperatures."

To underscore this message, Eaton submitted the declaration of Kenneth A. Nelson, the chemist who developed the claimed adhesive. Mr. Nelson's declaration disclosed a two-prong test for the claim requirement. That test requires, first, placing a 1/16 inch layer of adhesive upside-down in an oven preheated to 120 degrees F for sixteen hours. Second, the test requires that the adhesive be hung vertically in an oven at 77 degrees F for sixty-three hours. An adhesive meets Eaton's requirement if the glue does not flow from the tray during either of these tests.

The Board understood and accepted this specific definition of plastic flow temperature. In its November 30, 1983, opinion, the Board recognized "plastic flow temperature" as the "characteristic of the adhesive . . . required to prevent the adhesive from flowing or sagging at temperatures at which the trap is shipped, stored, or used." The Board noted that prior art publications did not anticipate Eaton's claims because they lacked adhesives with these plastic flow properties:

Prior to the instant invention, glue traps were prepared by the user rather than the manufacturer in that

ready made traps could not be readily shipped and stored. Workers in this art were working to find various means to solve these problems. Appellants recognized this problem and conceived of the idea embodied in the instant claims of utilizing an adhesive having special plastic flow properties. Thus, the full administrative record gives an explicit and reasonable meaning of "plastic flow temperature" that focuses on shipping and storage of the commercial trap product without adhesive spillage. Mr. Nelson's two-prong test makes Eaton's definition unmistakable to one of skill in the art. For this reason, the Eastern District of New York adopted the Nelson tests as the definition of "plastic flow temperature." Indeed, another district court interpreted "plastic flow temperature" in the same '584 patent precisely in accordance with Mr. Nelson's declaration. See *J.T. Eaton & Co. v. Bell Lab., Inc.*, No. 95-C-0441-S (W.D. Wis. March 29, 1996) (oral jury instructions). Thus, the examiner, the Board (twice), and two district courts read the plastic flow limitation in accordance with the Nelson tests.

Trial testimony from one skilled in the art confirmed the logic of this uniform claim

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interpretation. According to this testimony, Mr. Nelson's sixteen hour inverted horizontal test at 120 degrees F properly tested the product under typical shipping conditions. After all, elevated temperatures would not last longer than normal daylight hours. Testing the adhesives beyond sixteen hours made little sense in the context of shipping these products in trucks and boxcars. Likewise, according to the same testimony, the lengthy vertical test at 77 degrees F properly reflected the prolonged periods of shelf storage at normal room temperatures. Given this logical explanation, there is little wonder every other agency and court that reviewed Eaton's claims accepted the same interpretation.

II.

Despite the overall content of the prosecution history, this court stretched the vertical flow test concept out of proportion, exaggerated the stringency of that test beyond the realities of storage and shipping, and made it the sole talisman of the Eaton claim. In its brief, Atlantic urged this court to find a stringent vertical flow test in a single sentence of the voluminous prosecution history: Plastic flow temperature, as used herein, is that temperature below which the adhesive will not flow or sag even if stored with the surface of a thick (1/16 to 1/8 inch) layer of adhesive vertical for unlimited periods of time. (Applicant's Brief to Board of Patent Appeals and Interferences, December 27, 1982) Based on this statement, Atlantic argued that an accused trap product could not infringe unless it could dangle in a vertical position at 120 degrees F for an infinite period of time without any glue flow. Like the district court before it, however, this court recognized that one skilled in the art could not reasonably rely on such obvious hyperbole as if it affected the scope of the claim. See *Intervet Am., Inc. v. Kee-Vet Lab., Inc.*, 887 F.2d 1050, 1054, 12 USPQ2d 1474, 1477 (Fed. Cir. 1989) (holding that claim language controls over an attorney's "erroneous remarks" made during the course of prosecution). Accordingly, the panel rejected this rationale. In so doing, it rejected the only claim interpretation proffered by Atlantic for "plastic flow temperature."

Without any basis in argument from either party or testimony from the trial record, the panel's ultimate claim construction rests on its own collection of orphaned passages from the file history. According to the panel, these passages show that Eaton did not provide a test for measuring vertical flow. To the contrary, Eaton provided Mr. Nelson's 77 degrees F vertical test -- a test designed for temperatures where the products are likely to hang on vertical displays. Nonetheless, this court created the myth of a "missing vertical test" to justify its reliance on two paragraphs in Mr. Questel's declaration (paragraphs 22 and 23) -- a declaration filed two years after the '584 patent originally issued.

This court's reading of the record goes astray in several ways. First, nowhere does the '584 patent prosecution suggest the necessity of a 120 degrees F vertical flow test. The "missing" test was not missing at all, but was simply not required by the claims. Before the PTO, Eaton consistently stressed that the Nelson tests defined "plastic flow temperature" under temperature conditions likely to be

encountered during shipping and storage. Second, the brief extract from Mr. Questel's declaration simply lacks the meaning and the importance attributed to it by the panel.

A.

The premise underlying this court's opinion is that Mr. Questel supplied a missing test for vertical flow two years after the patent issued. The panel divines this premise from a few passages in which Eaton generally describes the advantages of the claimed adhesive. For example, the panel opinion relies on Eaton's statements to the Board on December 27, 1982:

Also importantly, the adhesive must have temperature-flow characteristics such that even if the surface of the adhesive is vertical, the adhesive will not flow or sag at ordinarily encountered ambient storage temperatures (less than 120 degrees F). That is to say, the plastic flow temperature of the adhesive must be above 120 degrees F.

According to the panel, this quote demonstrates that "plastic flow temperature" had a vertical component that Mr. Nelson did not measure. To the contrary, Eaton did not shirk its duty to define the claim terms. In the very same 1982 brief, when actually distinguishing the prior art cited by the examiner, Eaton specifically cited to the Nelson tests as the definition of "plastic flow temperature." The record is replete with other instances in which Eaton mentioned the word "vertical" in contexts fully consistent with using the Nelson tests as the measure of plastic flow temperature. For example, in its Amendment filed July 24, 1981, Eaton argued:

A trap made [in the manner described in the application] has been evaluated by

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Kenneth A. Nelson and found to have acceptable plastic flow characteristics. The trap can therefore be shipped or stored in vertical or inverted horizontal positions without fear of plastic flow and thus contamination of adjacent surfaces or spilling.

Eaton simply did not argue for its patent on the basis of some undefined vertical flow capabilities. Eaton had no need to test vertical flow above 77 degrees F because its traps would be displayed vertically only at room temperature.

More importantly, the PTO understood this simple principle. The PTO did not understand Eaton to rely on a stringent vertical test for flow characteristics. Both the examiner and the Board expressly disclaimed any reliance on vertical or horizontal testing to determine patentability of the claimed invention. For example, the examiner stated on May 27, 1986:

[W]hether the body tests were done in vertical, inverted horizontal or flat horizontal position has no relevance. The claims do not specify what position the adhesive is in regarding vertical flow.

The Board expressed a similar view in its January 16, 1987, decision on the second reexamination:

The claims on appeal do not include any limitations restricting the orientation of the commercial trap product defined therein to any particular horizontal, vertical, or inverted disposition, nor are there any limitations requiring flow of the adhesive from the container to be prevented for any particular length of time.

These passages make absolutely clear that the PTO did not decide to issue the '584 patent based on any of Eaton's statements about vertical flow or any of Mr. Questel's tests. Instead, it is this court that first imports into the claims a supposed limitation from the prosecution history -- a limitation on which neither the applicant nor the PTO relied during acquisition of the patent.

In fact, the PTO never objected to the phrase "plastic flow temperature" as indefinite for lack of a vertical flow test. If vertical flow was the pivotal claim parameter perceived by this court, then the PTO should have noted its absence. Instead, the lengthy prosecution culminated in the issuance of the '584 patent without so much as a mention of a mythical "missing" vertical test.

Finally, Eaton did not, as the panel suggests, switch its focus from the Nelson tests to the Questel tests during the final chapter of the prosecution. Rather, at the conclusion of the second reexamination, as at the beginning, Eaton relied on its consistent definition of plastic flow temperature:

The terminology "plastic flow temperature" in appellants' claims on appeal has that meaning which is made clear elsewhere in the patent or in the file wrapper. . . . Appellants defined their terminology "plastic flow temperature" throughout the prosecution of their application which matured as the subject patent as being a characteristic of the adhesive which would prevent the adhesive from sagging or flowing from its support at temperatures at which their product is shipped, stored, or used. This passage shows that Eaton did not attempt to switch arguments on the PTO in the closing chapter of the prosecution.

Perhaps aware of the danger of stringing together isolated passages out of context, this court tries to correlate these passages by reference to private communications between Eaton's lawyers and scientists. Specifically, the panel relies on Eaton's attorney's instructions to Mr. Nelson about vertical flow testing. Far from supporting the missing test myth, this tactic betrays this court's flawed method of seeking claim meaning. These privileged exchanges are not part of the public record. Even if Eaton's attorneys believed patentability turned on vertical flow at 120 degrees F, such private correspondence, not a part of the public record, cannot possibly supply evidence of claim meaning. See *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979, 34 USPQ2d 1321, 1329 (Fed. Cir. 1995) (patent claims are construed in light of the public record), *aff'd*, 116 S. Ct. 1384 [38 USPQ2d 1461] (1996). Thus, this court relies not only on out-of-context extracts, but on extracts without any relevance to claim interpretation. Indeed, few of the isolated passages on which this court relies had anything to do with the meaning of the plastic flow characteristic. Neither Eaton nor the Board relied on the passages to which this court attaches dispositive significance.

For all these reasons, I must conclude that this court has created a requirement for a stringent vertical flow test that the claims, read in light of the prosecution history, do not require. Had Eaton truly acquired its patent by requiring such a test, the record would surely contain far more emphatic evidence than the few isolated passages cited in the panel opinion. See *York Prods., Inc. v. Central Tractor Farm & Family Center*, 99 F.3d 1568, 1575, 40 USPQ2d 1619, 1624 (Fed. Cir. 1996) ("Unless altering claim language to escape an examiner rejection, a patent applicant only limits claims during

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prosecution by clearly disavowing claim coverage.").

B.

Without doubt, the precedent of this court indicates that a patentee's remarks during patent prosecution can illuminate the meaning of the claims. See *Markman*, 52 F.3d at 980; *Vitronics*, 90 F.3d at 1582-83. However, our precedent makes equally clear that this court construes an administrative record in its full context, not on the basis of snippets lifted out of context. See *Unique Concepts, Inc. v. Brown*, 939 F.2d 1558, 1565, 19 USPQ2d 1500, 1506 (Fed. Cir. 1991) ("We construe claims in the light of the language of the claim itself, the specification on which it is based, and the whole prosecution history.") (Rich, J., dissenting); see also *Mark I Mktg. Corp. v. R.R. Donnelley & Sons Co.*, 66 F.3d 285, 292, 36 USPQ2d 1095, 1100 (Fed. Cir. 1995), *cert. denied*, 116 S. Ct. 917 (1996). Moreover, the reviewing court must examine the full context of prosecution history to discern not only what the applicant said, but why he said it. Cf. *Herbert v. Lisle Corp.*, 99 F.3d 1109, 1118, 40 USPQ2d 1611, 1617 (Fed. Cir. 1996) ("It is of course necessary to consider not only the amendments to the claims but the reason why they were made. . . .").

These basic legal principles disclose the infirmity of the court's reliance on two paragraphs from a single declaration at the end of the second reexamination. A fair reading of the declaration indicates that Mr. Questel distinguished the prior art Formula No. 31 adhesive on two grounds: (1) it exhibited unacceptable levels of cold flow (i.e., 72 degrees F) in a vertical orientation; and (2) it exhibited unacceptable levels of hot flow when tested at 100 degrees F in a vertical orientation. Thus, although Mr. Questel conducted twenty-four hour vertical tests at 120 degrees F, neither he nor Eaton ever relied on such tests to distinguish any prior art. Nor did Mr. Questel in any way suggest that he considered a

twenty-four hour vertical test at 120 degrees F to be the measure of "plastic flow temperature." This record simply does not support the court's conclusion that Eaton's claims are measured by the 120 degrees F vertical flow test. See *Ethicon Endo-Surgery, Inc. v. United States Surgical Corp.*, 93 F.3d 1572, 1581, 40 USPQ2d 1019, 1025-26 (Fed. Cir. 1996) (looking to "the prosecution history as a whole" to determine how one skilled in the art would understand a claim term) (Clevenger, J.). Sadly, this court's fixation on the 120 degrees F vertical flow test foreclosed the one claim construction that was used repeatedly by all parties throughout the public record. The district court properly used that claim interpretation. This court errs in departing from the full context of the administrative record, and importing a false limitation from the prosecution history.

III.

Finally, even if I agreed with the panel's claim construction, I could not join a reversal of the district court's finding of infringement. This court decides this issue against Eaton on the basis of a failure of proof -- that is, Eaton's failure to prove infringement under a claim meaning no one had ever imagined before this court's pronouncement. The panel reasons that Eaton should have known this court's interpretation of the claims, and therefore had the burden of presenting adequate proof of infringement. Contrary to this assumption, no patentee in Eaton's position could have predicted this court's peculiar claim construction. Even Atlantic, a company with a strong incentive to adopt any argument to avoid infringement, did not proffer this court's late-coming interpretation.

In light of the time and resources invested in this patent and this infringement battle, this court might at least have afforded Eaton an opportunity to present evidence of infringement under this panel's novel claim construction. Accordingly, even if I could accept the court's claim meaning, I would remand the case for further proceedings.

IV.

This decision stands as a monument at the troubled intersection between legal and factual analyses in this court's post-*Markman* jurisprudence. That claims must be construed by the court does not divorce the interpretive process from a host of inherently factual subsidiary matters, such as how one skilled in the art would understand claim terms and prosecution history statements. *Markman v. Westview Instruments, Inc.*, 116 S. Ct. 1384, 1395-96 [38 USPQ2d 1461] (1996) ("We accordingly think there is sufficient reason to treat construction of terms of art like many other responsibilities that we cede to a judge in the normal course of trial, notwithstanding its evidentiary underpinnings."). This court's role in reviewing claim meanings discerned by the district courts calls for modesty and restraint -- born not of timidity, but of recognition of the limits inherent in appellate review. When an appel

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late court arrives at a novel claim interpretation after nearly twenty years of prosecution and litigation, it is inadequately equipped to test its new and unprecedented reading against the views of those skilled in the art. I believe the court today has overstepped the boundaries of effective appellate review. Perhaps this court was influenced by the district court's finding that, but for the commercial success of Eaton's trap products, the '584 patent would be obvious. Unfortunately, this court does not address the issue of obviousness directly, see, e.g., *Newell Cos., Inc. v. Kenney Manufacturing Co.*, 864 F.2d 757, 768-69, 9 USPQ2d 1417, 1426-27 (Fed. Cir. 1988) (concluding that the patent-in-suit was obvious despite strong evidence of commercial success), but instead distorts claim interpretation techniques to defeat infringement. Although sensitive to questions about the validity of the '584 patent, I believe that the court should not give voice to those questions by means of a disingenuous reading of the prosecution history. Accordingly, I must respectfully dissent.

Footnotes

Footnote *. The exact development of the adage remains a mystery. American essayist and poet Ralph Waldo Emerson (1803-1882) wrote in an 1855 essay in *Journals* :
 I trust a good deal to common fame, as we all must. If a man has good corn, or wood, or boards, or pigs, to sell, or can make better chairs or knives, crucibles, or church organs, than any body else, you will find a broad, hard-beaten road to his house, though it be in the woods.
 The mousetrap, however, did not appear until seven years after Emerson's death. Mrs. Sarah S.B. Yule, in her book *Borrowings* (1889), insisted that at a lecture Emerson had stated a catchier variation: "If a man write a better book, preach a better sermon, or make a better mousetrap than his neighbor, though he build his house in the woods, the world will make a beaten path to his door." More recently, in a twentieth century adaptation, Newman Levy wrote: "If a man builds a better mousetrap than his neighbor, the world will not only beat a path to his door, it will make newsreels of him and his wife in beach pajamas, it will discuss his diet and his health, it will publish heart-throb stories of his love life."

- End of Case -

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FULL TEXT OF CASES (USPQ2D)

All Other Cases

Vitronics Corp. v. Conceptronic Inc. (CA FC) 39 USPQ2d 1573 (7/25/1996)

Vitronics Corp. v. Conceptronic Inc. (CA FC) 39 USPQ2d 1573

Vitronics Corp. v. Conceptronic Inc.

U.S. Court of Appeals Federal Circuit
39 USPQ2d 1573

Decided July 25, 1996
No. 96-1058

Headnotes

PATENTS

1. Patent construction -- Claims -- Defining terms (§ 125.1305)

Term "solder reflow temperature," as used in claim for method of reflow soldering electrical devices to printed circuit boards, must be construed to mean "peak reflow temperature" of solder rather than lower "liquidus temperature" of solder, since "peak reflow temperature" and "liquidus temperature" are given distinctly different meanings in specification, and since claim, in order to be consistent with specification and preferred embodiment described therein, must be construed such that "solder reflow temperature" means peak reflow temperature.

2. Patent construction -- In general (§ 125.01)

Federal district court may rely on expert testimony and other extrinsic evidence to help it understand underlying technology in patent case, but may rely on expert testimony concerning proper construction of disputed patent term only in rare event that patent documents, taken as whole, are insufficient to enable court to construe disputed term; even then, prior art documents and dictionaries are more reliable guides than opinion testimony on claim construction, which is no more reliable than opinion testimony on statutory construction and should therefore be treated with utmost caution.

Particular patents -- Electrical -- Circuit boards

4,654,502, Furtek, method for reflow soldering of surface mounted devices to printed circuit boards, judgment of non-infringement as matter of law reversed.

Case History and Disposition:

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Appeal from the U.S. District Court for the District of New Hampshire, Loughlin, J.

Action by Vitronics Corp. against Conceptronic Inc. for patent infringement. From judgment as matter of law that plaintiff failed to prove infringement, plaintiff appeals. Reversed and remanded.

Related decision: 27 USPQ2d 1046.

Attorneys:

James J. Foster, Lawrence M. Green, and Brett N. Dorny, of Wolf, Greenfield & Sacks, Boston, Mass., for plaintiff-appellant.

Paul J. Hayes and Dean G. Bostock, of Weingarten, Schurgin, Gagnebin & Hayes, Boston, for defendant-appellee.

Judge:

Before Michel and Lourie, circuit judges, and Friedman, senior circuit judge.

Opinion Text**Opinion By:**

Michel, J.

Vitronics Corporation ("Vitronics") appeals the September 27, 1995 order of the United States District Court for the District of New Hampshire, Civil Action No. 91-696-L, entering judgment as a matter of law that Vitronics did not prove that Conceptronic, Inc. ("Conceptronic") infringed claim 1 of U.S. Patent No. 4,654,502 ("the '502 patent"). The appeal was submitted for decision after oral argument on May 8, 1996. Because we conclude that the specification of the '502 patent dictates a claim interpretation in accordance with the plaintiff's proposed construction, and that, so construed, the '502 patent may have been infringed, we reverse the trial court's decision and remand for further proceedings.

BACKGROUND**The Patented Invention**

Vitronics and Conceptronic both manufacture ovens used in the production of

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printed circuit boards. The ovens are used to solder electrical devices (such as resistors, capacitors and integrated circuits) to the boards. Several methods of soldering devices to boards have been developed; the '502 patent, assigned to Vitronics, is directed to one of those methods.

Specifically, the '502 patent is directed to a method for the reflow soldering of surface mounted devices to a printed circuit board in which the circuit board is moved by a conveyor through a multizone oven. In this process, a solder paste is placed on the circuit board and the devices to be soldered (with attached connectors) are placed on the paste. The circuit board is then placed on what is basically a conveyor belt running through an oven and passing through several different heating zones. In the final and hottest zone, the solder paste melts and forms a connection between the device and the circuit board. The boards remain in the last heating zone for only a short duration, allowing the solder to reach a temperature high enough to cause the solder to melt and reflow while maintaining the devices themselves below the solder reflow temperature. Due to this temperature differential, the solder flows up the device connectors to form a solid connection.

Claim 1 of the '502 patent, the only claim at issue in this appeal, reads as follows (with added emphasis on the disputed terms):

1. A method for reflow soldering of surface mounted devices to a printed circuit board comprising: moving a printed circuit board having solder and devices disposed on a surface thereof through a first zone and in close proximity to a first emitting surface of at least one nonfocused infrared panel emitter, said first emitting surface being at a first panel temperature; moving said board through a second zone and in close proximity to a second emitting surface of at least one nonfocused infrared panel emitter, said second emitting surface being at a second panel temperature lower than said first panel temperature; and moving said board through a third zone and in close proximity to a third emitting surface of at least one nonfocused infrared panel emitter, said third emitting surface being at a third panel temperature higher than said second panel temperature, said third emitting surface heating said board and said solder to a *solder reflow temperature* for a period of time sufficient to cause said solder to reflow and solder said devices to said board while maintaining the temperature of said devices below *said solder reflow temperature*.

Proceedings Before the District Court

This action was brought on November 26, 1991 by Vitronics against Conceptronic for infringement of both the '502 patent and U.S. Patent No. 4,833,301 ("the '301 patent"). 1 At the time the suit was filed, Conceptronic was selling the "Mark series" line of ovens. Conceptronic later discontinued the Mark series and began selling the "HVC series" line of ovens. Prior to trial, the parties stipulated that every limitation of claim 1 of the '502 patent was met by the HVC series of ovens, except the limitation requiring the utilization of "nonfocused infrared panel emitters" and the limitation that the temperature of the devices must be maintained below the "solder reflow temperature." 2

Vitronics, by way of a request for a jury instruction, asked the court to construe the meaning of the "solder reflow temperature" limitation. The specific instruction sought by Vitronics was as follows: In considering the question of whether the '502 method patent has been infringed by the Mark and HVC Series ovens, you have to decide whether, in use, those ovens maintain the temperature of the devices below the solder reflow temperature. The phrase "solder reflow temperature" in the '502 patent means the temperature reached by the solder during the period it is reflowing during the final stages of the soldering process, sometimes referred to as the "peak solder reflow temperature." It does not mean the "liquidus temperature," the temperature at which the solder first begins to melt. Thus, if the temperature of the devices stays below that of the solder, the '502 method patent is infringed by the Mark and HVC Series ovens.

Thus, Vitronics contended that, as used in the claim, solder reflow temperature means peak reflow temperature, *i.e.*, a temperature approximately 20 degrees C above the liquidus temperature, at which the solder is completely melted and moves freely. Conceptronic, on the other hand, contended that solder reflow temperature means 183 degrees C, *i.e.*, the liquidus temperature of a particular type of solder known as 63/37 (Sn/Pb) solder. 3

The district court delayed construing the disputed language until the close of testimony, at which time it ruled in favor of Conceptronic and concluded that the term "solder reflow temperature" as used in claim 1 refers to 183 degrees C. Vitronics then conceded that the court was required to grant judgment as a matter of law in favor of Conceptronic, as Vitronics had not presented any evidence of infringement under the court's interpretation of solder reflow temperature. This appeal followed.

Claim Construction Aids Before the District Court

In spite of Vitronics' early request for a jury instruction on the proper claim construction, the district court delayed announcing its claim construction until hearing all the evidence put forth at trial. During trial, and in their briefs to the district court in support of their respective claim constructions, the parties discussed the patent specification, expert testimony, prior testimony and writings of Vitronics and its employees, and technical references. The most pertinent materials are discussed below. *The Patent Specification*

Vitronics relied heavily upon the patent itself to support its asserted claim construction. Although Vitronics conceded that the term "solder reflow temperature" may be ambiguous when considered in isolation, it argued that the specification clearly shows that, as used in the claim, solder reflow temperature means peak reflow temperature rather than the liquidus temperature. In particular, Vitronics pointed to that part of the specification that describes a preferred embodiment:

A preferred embodiment of the invention for reflow soldering of surface mounted devices to printed circuit boards will now be described. The printed circuit boards are typically made of epoxy-glass, such as fire retardant 4(FR-4), or polyamide glass. These boards typically degrade above temperatures of 225 degrees C. The solder may be, for example, 60/40 (Sn/Pb), 63/37 (Sn/Pb), or 666/2 (Sn/Pb/Ag), all of which have a liquidus temperature (*i.e.* begin to melt) of about 190 degrees C. and a peak reflow temperature of about 210 degrees -218 degrees C. Thus, to effect reflow soldering without damaging the board, the solder must be allowed to reach a temperature of at least 210 degrees C., but the board cannot reach a temperature of 225 degrees C.

... The board is then sent into a fifth zone 5 to bring the temperature of the board up to a temperature of approximately 210 degrees C., the devices up to approximately 195 degrees C., and the solder up to approximately 210 degrees C. for a period of time of from about 10 to about 20 seconds to cause the solder to flow. Because the devices are cooler than the board, the solder flows up the devices. ... The board spends approximately 60 seconds in the fifth zone, but only about 10 to 20 seconds at 210 degrees C. Thus, the board is at the solder reflow temperature for only a short period of time and the devices never reach the solder reflow temperature.

Vitronics pointed out that, in the example described as the preferred embodiment, the temperature of the solder is raised to 210 degrees C, the peak reflow temperature, and the temperature of the devices is raised to 195 degrees C, 5 degrees above the 190 degrees C liquidus temperature. Thus, as argued by Vitronics, the term "solder reflow temperature" must be construed so that it refers to the peak reflow temperature because the claim requires that the temperature of the devices be maintained below "said solder reflow temperature"; if solder reflow temperature were construed to refer to liquidus temperature, the preferred embodiment would not be covered by the patent claims. *Expert Testimony*

Conceptronic relied heavily on the expert testimony of Dr. Rothe. Dr. Rothe testified that the meaning of the term "solder reflow temperature" in claim 1 is synonymous with liquidus temperature. Dr. Rothe further testified that the solder reflow temperature for 63/37 (Sn/Pb) is 183 degrees C. Dr. Rothe likewise testified at trial that several technical articles written by those skilled in the art supported his view that solder reflow temperature refers to liquidus temperature. *The Testimony of Mr. Hall*

Conceptronic also relied on the testimony of Mr. Hall, the Chief Engineer at Vitronics. At trial, Mr. Hall confirmed that during his deposition he had testified that the reflow temperature of solder was 183 degrees C. Mr. Hall also testified that, during his deposition, he had used solder reflow temperature to refer to liquidus temperature. However, at another point in his trial testimony, Hall explained that, while in his earlier deposition testimony he had used solder reflow temperature to refer to liquidus temperature, he

did not suggest that was how the term was used in the patent. Rather, Hall testified the patent uses the term to refer to the peak reflow temperature. *Paper Written By Former Vitronics Employee* Conceptronic also introduced into evidence a paper written by Phillip Zarrow, a former employee of Vitronics, defining solder reflow temperature in the following manner: "As the temperature of the solder paste on the interconnect passes the solder alloy's melting point and the solder enters a molten state, the assembly enters the reflow region of the process. For 63 Sn/37 Pb, a eutectic solder and the most common SMT alloy, reflow occurs at 183 degrees C." Phillip Zarrow, *Convection/Infrared and Convection Dominant Reflow Soldering of Fine Pitch SMT Devices*, Section 10.3.3 (1994). However, that same paper later describes the solder reflow process as taking the temperature of the solder above liquidus: "Most solder manufacturers recommend bringing the interconnection temperature approximately 15 to 25 degrees C above the alloy melting point to achieve full liquidus and assure good solder flow and aid fillet formation." *Id.*

Memorandum of Plaintiff Vitronics Corporation in Opposition to Motion for Summary Judgment of Defendant Conceptronic Corporation and In Support of Plaintiff's Cross-Motion for Summary Judgment of Patent Validity and Infringement In its brief supporting its proposed construction of claim 1, both at the trial court level and here on appeal, Conceptronic similarly relied on a memorandum written by Vitronics which contains the following language: "Tin/lead solders commonly used by the electronic products industry have a 'liquidus' or 'reflow' temperature in the order of 183 degrees C, or about 361 degrees F." However, this phrase is in the background section of the memorandum and later in the same memorandum, Vitronics discussed the issue of infringement as being whether the temperature of the devices was maintained below "the temperatures of the leads at which the solder is reflowing."

Without indicating which evidence it relied upon, the district court simply ruled that solder reflow temperature meant 183 degrees C.

ANALYSIS

The Use of Intrinsic and Extrinsic Evidence in Claim Construction

A literal patent infringement analysis involves two steps: the proper construction of the asserted claim and a determination as to whether the accused method or product infringes the asserted claim as properly construed. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976, 34 USPQ2d 1321, 1326 (Fed. Cir. 1995) (in banc), *aff'd*, ___ U.S. ___, 116 S. Ct. 1384, 1393 [38 USPQ2d 1461] (1996); *Hormone Research Found., Inc. v. Genentech, Inc.*, 904 F.2d 1558, 1562, 15 USPQ2d 1039, 1042 (Fed. Cir. 1990), *cert. dismissed*, 499 U.S. 955 (1991). The first step, claim construction, is a matter of law, which we review *de novo*. *Markman*, 52 F.3d at 979, 34 USPQ2d at 1329. Claim construction is the only step in the infringement analysis at issue in this appeal. 4

In determining the proper construction of a claim, the court has numerous sources that it may properly utilize for guidance. These sources have been detailed in our previous opinions, as discussed below, and include both intrinsic evidence (*e.g.*, the patent specification and file history) and extrinsic evidence (*e.g.*, expert testimony).

It is well-settled that, in interpreting an asserted claim, the court should look first to the intrinsic evidence of record, *i.e.*, the patent itself, including the claims, the specification and, if in evidence, the prosecution history. *See Markman*, 52 F.3d at 979, 34 USPQ2d at 1329. Such intrinsic evidence is the most significant source of the legally operative meaning of disputed claim language.

First, we look to the words of the claims themselves, both asserted and nonasserted, to define the scope of the patented invention. *See Bell Communications Research, Inc. v. Vitalink Communications Corp.*, 55 F.3d 615, 620, 34 USPQ2d 1816, 1819 (Fed. Cir. 1995). Although words in a claim are generally given their ordinary and customary meaning, a patentee may choose to be his own lexicographer and use terms in a manner other than their ordinary meaning, as long as the special definition of the term is

clearly stated in the patent specification or file history. *Hoechst Celanese Corp. v. BP Chems. Ltd.*, 78 F.3d 1575, 1578, 38 USPQ2d 1126, 1129 (Fed. Cir. 1996) ("A technical term used in a patent document is interpreted as having the meaning that it would be given by persons experienced in the field of the invention, unless it is apparent from the patent and the prosecution history that the inventor used the term with a different meaning.") (citations omitted); *Hormone*, 904 F.2d at 1563, 15 USPQ2d at 1043 ("It is a well-established axiom in patent law that a patentee is free to be his or her own

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lexicographer and thus may use terms in a manner contrary to or inconsistent with one or more of their ordinary meanings.") (citations omitted).

Thus, second, it is always necessary to review the specification to determine whether the inventor has used any terms in a manner inconsistent with their ordinary meaning. The specification acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication. *Markman*, 52 F.3d at 979, 34 USPQ2d at 1330. As we have repeatedly stated, "[c]laims must be read in view of the specification, of which they are a part." *Id.* at 979, 34 USPQ2d at 1329. The specification contains a written description of the invention which must be clear and complete enough to enable those of ordinary skill in the art to make and use it. Thus, the specification is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.

Third, the court may also consider the prosecution history of the patent, if in evidence. *Id.* at 980, 34 USPQ2d at 1330; *Graham v. John Deere*, 383 U.S. 1, 33, 148 USPQ 459, 473 (1965). This history contains the complete record of all the proceedings before the Patent and Trademark Office, including any express representations made by the applicant regarding the scope of the claims. As such, the record before the Patent and Trademark Office is often of critical significance in determining the meaning of the claims. See *Markman*, 52 F.3d at 980, 34 USPQ2d at 1330; *Southwall Tech., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1576, 34 USPQ2d 1673, 1676 (Fed. Cir. 1995) ("The prosecution history limits the interpretation of claim terms so as to exclude any interpretation that was disclaimed during prosecution.") (citations omitted). Included within an analysis of the file history may be an examination of the prior art cited therein. *Autogiro Co. of America v. United States*, 384 F.2d 391, 399, 155 USPQ 697, 704 (Ct. Cl. 1967) ("In its broader use as source material, the prior art cited in the file wrapper gives clues as to what the claims do not cover.").

In most situations, an analysis of the intrinsic evidence alone will resolve any ambiguity in a disputed claim term. In such circumstances, it is improper to rely on extrinsic evidence. See, e.g., *Pall Corp. v. Micron Separations, Inc.*, 66 F.3d 1211, 1216, 36 USPQ2d 1225, 1228 (Fed. Cir. 1995) ("In construing the claims we look to the language of the claims, the specification, and the prosecution history. Extrinsic evidence may also be considered, *if needed* to assist in determining the meaning or scope of technical terms in the claims.") (citations omitted, emphasis added); *Hormone*, 904 F.2d at 1562, 15 USPQ2d at 1043 ("Claim interpretation involves a review of the specification, the prosecution history, the claims (including unasserted as well as asserted claims), and, *if necessary*, other extrinsic evidence, such as expert testimony.") (citations omitted, emphasis added). In those cases where the public record unambiguously describes the scope of the patented invention, reliance on any extrinsic evidence is improper. The claims, specification, and file history, rather than extrinsic evidence, constitute the public record of the patentee's claim, a record on which the public is entitled to rely. In other words, competitors are entitled to review the public record, apply the established rules of claim construction, ascertain the scope of the patentee's claimed invention and, thus, design around the claimed invention. See *Markman*, 52 F.3d at 978-79, 34 USPQ2d at 1329. Allowing the public record to be altered or changed by extrinsic evidence introduced at trial, such as expert testimony, would make this right meaningless. See *Southwall*, 54 F.3d at 1578, 34 USPQ2d at 1678 ("A patentee may not proffer an interpretation for the purposes of litigation that would alter the indisputable public record

consisting of the claims, the specification and the prosecution history, and treat the claims as a 'nose of wax.' " (quoting *Senmed, Inc. v. Richard-Allan Med. Indus., Inc.* , 888 F.2d 815, 819 n.8, 12 USPQ2d 1508, 1512 n.8 (Fed. Cir. 1989)). The same holds true whether it is the patentee or the alleged infringer who seeks to alter the scope of the claims.

The Proper Construction of the Claim Term "Solder Reflow Temperature"

[1] As can be readily seen from those portions of the specification set forth above, the meaning of the disputed term "solder reflow temperature" in claim 1 of the '502 patent is clear from a reading of the claim itself and the patent specification. The "peak reflow temperature" and "liquidus temperature" are clearly defined in the specification as having distinctly different meanings. Specifically, for the solders described in the specification, liquidus temperature is about 190 degrees C and the peak reflow temperature is about 210 degrees to 218 degrees C. Moreover, in the preferred embodiment described in the patent, the solder is heated to a temperature of 210 degrees C but the temperature of the devices is maintained at approximately 195 degrees C, *i.e.* , below the peak reflow temperature (210 degrees C) but above the liquidus temperature (190 degrees C). Therefore, in order to be consistent with the specification and preferred embodiment described therein, claim 1 must be construed such that the term "solder reflow temperature" means the peak reflow temperature, rather than the liquidus temperature. Indeed, if "solder reflow temperature" were defined to mean

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liquidus temperature, a preferred (and indeed only) embodiment in the specification would not fall within the scope of the patent claim. Such an interpretation is rarely, if ever, correct and would require highly persuasive evidentiary support, which is wholly absent in this case. *See Modine Mfg. Co. v. United States Int'l Trade Comm'n* , 75 F.3d 1545, 1550, 37 USPQ2d 1609, 1612 (Fed. Cir. 1996); *see also Hoechst* , 78 F.3d at 1581, 38 USPQ2d at 1130 ("We share the district court's view that it is unlikely that an inventor would define the invention in a way that excluded the preferred embodiment, or that persons of skill in this field would read the specification in such a way."). *The District Court's Reliance on Extrinsic Evidence*

Since the claim, read in light of the patent specification, clearly uses the term "solder reflow temperature" to mean the peak reflow temperature, rather than the liquidus temperature, that should have been the end of the trial court's analysis. 5 Only if there were still some genuine ambiguity in the claims, after consideration of all available intrinsic evidence, should the trial court have resorted to extrinsic evidence, such as expert testimony, in order to construe claim 1. Moreover, even if the judge permissibly decided to hear all the possible evidence before construing the claim, the expert testimony, which was inconsistent with the specification and file history, should have been accorded no weight. *Southwall* , 54 F.3d at 1578, 34 USPQ2d at 1678; *Markman* , 52 F.3d at 983, 34 USPQ2d at 1333. Here, the trial judge considered not only the specification, but also expert testimony and other extrinsic evidence, such as the paper written by the former Vitronics employee. No doubt there will be instances in which intrinsic evidence is insufficient to enable the court to determine the meaning of the asserted claims, and in those instances, extrinsic evidence, such as that relied on by the district court, may also properly be relied on to understand the technology and to construe the claims. *See Markman* , 52 F.3d at 979, 34 USPQ2d at 1329. Extrinsic evidence is that evidence which is external to the patent and file history, such as expert testimony, inventor testimony, dictionaries, and technical treatises and articles. 6 *Id.* at 980, 34 USPQ2d at 1330. However, as we have recently re-emphasized, extrinsic evidence in general, and expert testimony in particular, may be used only to help the court come to the proper understanding of the claims; it may not be used to vary or contradict the claim language. *Id.* at 981, 34 USPQ2d at 1331. Nor may it contradict the import of other parts of the specification. Indeed, where the patent documents are unambiguous, expert testimony regarding the meaning of a claim is entitled to no weight. *Southwall* , 54 F.3d at 1578, 34 USPQ2d at 1678. "Any other rule would be unfair to competitors who must be able to rely on the patent documents themselves, without consideration of expert opinion that then does not even exist, in ascertaining the scope of a patentee's right to exclude."

Id. at 1578, 34 USPQ2d at 1678-79. Nor may the inventor's subjective intent as to claim scope, when unexpressed in the patent documents, have any effect. Such testimony cannot guide the court to a proper interpretation when the patent documents themselves do so clearly. In addition, a court in its discretion may admit and rely on prior art proffered by one of the parties, whether or not cited in the specification or the file history. This prior art can often help to demonstrate how a disputed term is used by those skilled in the art. Such art may make it unnecessary to rely on expert testimony and may save much trial time. As compared to expert testimony, which often only indicates what a particular expert believes a term means, prior art references may also be more indicative of what all those skilled in the art generally believe a certain term means. Once again, however, reliance on such evidence is unnecessary, and indeed improper, when the disputed terms can be understood from a careful reading of the public record. *See Kearns v. Chrysler Corp.*, 32 F.3d 1541, 1547, 31 USPQ2d 1746, 1750 (Fed. Cir. 1994). Nor may it be used to vary claim terms from how they are defined, even implicitly, in the specification or file history. Unfortunately, here the trial judge did use the extrinsic evidence to vary or contradict the manifest meaning of the claims. The trial judge was presented with expert testimony and other

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evidence that some of those skilled in the relevant art, including certain Vitronics employees, sometimes used the term "solder reflow temperature" and "liquidus temperature" interchangeably. He apparently relied on this testimony in reaching his conclusion that, as used in claim 1, solder reflow temperature meant 183 degrees C. 7 However, regardless of how those skilled in the art would interpret a term in other situations, where those of ordinary skill, on a reading of the patent documents, would conclude that the documents preclude the term being given the meaning propounded by the expert witnesses, we must give it the meaning indicated by the patentee in the patent claim, specification and file history. Thus, expert testimony tending to show that those skilled in the art would, in certain circumstances, understand "solder reflow temperature" to mean the solder liquidus temperature is entitled to no weight in light of the clear contrary meaning shown in the specification. *See Southwall*, 54 F.3d at 1578, 34 USPQ2d at 1678 ("Even if Southwall could show that 'sputter-deposited dielectric' has a meaning to one skilled in the art different from the definition in the '745 specification and file history, the definition in the patent documents controls the claim interpretation."). Because the specification clearly and unambiguously defined the disputed term in the claim, reliance on this extrinsic evidence was unnecessary and, hence, legally incorrect.

[2] Had the district court relied on the expert testimony and other extrinsic evidence solely to help it understand the underlying technology, we could not say the district court was in error. But testimony on the *technology* is far different from other expert testimony, whether it be of an attorney, a technical expert, or the inventor, on the *proper construction* of a disputed claim term, relied on by the district court in this case. The latter kind of testimony may only be relied upon if the patent documents, taken as a whole, are insufficient to enable the court to construe disputed claim terms. Such instances will rarely, if ever, occur. Indeed, this case did not present such an instance. Even in those rare instances, prior art documents and dictionaries, although to a lesser extent, are more objective and reliable guides. Unlike expert testimony, these sources are accessible to the public in advance of litigation. They are to be preferred over opinion testimony, whether by an attorney or artisan in the field of technology to which the patent is directed. Indeed, opinion testimony on claim construction should be treated with the utmost caution, for it is no better than opinion testimony on the meaning of statutory terms. *See Markman*, 52 F.3d at 983, 34 USPQ2d at 1332-33 ("First, the testimony of Markman and his patent attorney on the proper construction of the claims is entitled to no deference. . . . This testimony about construction, however, amounts to no more than legal opinion -- it is precisely the process of construction that the court must undertake.").

Other Issues

Conceptronic further argues that, even if we were to reverse the district court's decision regarding the

proper interpretation of the term "solder reflow temperature," the district court's ultimate conclusion of no infringement as a matter of law can still be affirmed on the alternative ground that Vitronics' evidence does not prove infringement because Vitronics failed to test the temperature of all of the various devices on the boards and because certain of the Vitronics tests demonstrated that many of the devices reached temperatures above the peak reflow temperature. Vitronics, of course, disputes these assertions and points to supporting documentation to the effect that the Conceptronic ovens do indeed maintain the temperature of the devices below peak reflow temperature. The trial court made no decision on this issue. Moreover, such a determination at this stage would require our weighing substantial but conflicting evidence, an impermissible exercise for an appellate court. Accordingly, we must remand.

CONCLUSION

For all the foregoing reasons, the judgment of non-infringement as a matter of law is reversed and the case is remanded for further proceedings consistent with this opinion. *REVERSED AND REMANDED*

COSTS

Costs in favor of Vitronics.

Footnotes

Footnote 1. A jury returned a verdict of non-infringement of the '301 patent. Vitronics does not appeal that verdict.

Footnote 2. Whether the Conceptronic ovens utilize nonfocused infrared panel emitters is not before this court.

Footnote 3. The specification of the '502 patent describes three exemplary types of solder which can be used in the solder reflow process -- 60/40 (Sn/Pb), 63/37 (Sn/Pb) and 666/2 (Sn/Pb/Ag) -- each of which, it indicates, has a liquidus temperature of about 190 degrees C and a peak reflow temperature of about 210 degrees to 218 degrees C. At trial, the parties appear to have discussed only 63/37 (Sn/Pb) solder, which has a liquidus temperature of 183 degrees C. However, the claims are not limited to that particular solder or a solder with that particular liquidus temperature.

Footnote 4. No assertion was made that defendant infringed under the doctrine of equivalents.

Footnote 5. The file history was apparently not put into evidence.

Footnote 6. Although technical treatises and dictionaries fall within the category of extrinsic evidence, as they do not form a part of an integrated patent document, they are worthy of special note. Judges are free to consult such resources at any time in order to better understand the underlying technology and may also rely on dictionary definitions when construing claim terms, so long as the dictionary definition does not contradict any definition found in or ascertained by a reading of the patent documents.

Footnote 7. Although the trial judge's reasoning does not appear in the record, he must have relied on the testimony presented by Conceptronic that "solder reflow temperature" and "liquidus temperature" were synonymous and the undisputed testimony that the liquidus temperature of 63/37 (Sn/Pb) solder is 183 degrees C.

- End of Case -

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Texas Digital Systems Inc. v. Telegenix Inc.

U.S. Court of Appeals Federal Circuit

No. 02-1032

Decided October 16, 2002

Headnotes

PATENTS

[1] Patent construction — Claims — In general (§125.1301)

Patent construction — Claims — Defining terms (§125.1305)

Dictionaries, encyclopedias, and treatises are reliable and objective sources of information for established meanings that would be attributed to claim terms by one skilled in art, and thus are not “extrinsic evidence” of meaning of claim terms, since such references are unbiased reflections of common understanding that are not influenced by expert testimony, colored by parties’ motives, or inspired by litigation; such materials may be consulted by trial and appellate judges at any stage of litigation, regardless of whether party has offered them into evidence, but intrinsic

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record must always be consulted to identify which of different possible dictionary meanings for claim terms at issue is most consistent with words used by inventor, and to determine whether presumption of ordinary and customary meaning is rebutted.

[2] Patent construction — Claims — In general (§125.1301)

Patent construction — Claims — Defining terms (§125.1305)

Dictionaries, encyclopedias, and treatises should be consulted to determine meaning of disputed claim

terms before intrinsic evidence is examined for this purpose, since consulting written description and prosecution history as threshold step in claim construction process, before any effort is made to discern ordinary and customary meanings attributed to words themselves, invites violation of rule against importing limitations into claims.

[3] Patent construction — Claims — Defining terms (§125.1305)

Phrase “repeatedly substantially simultaneously activating,” in claims of patents directed to devices for controlling color of pixels in light emitting diode display, is properly construed to require that during some portion of period defined as “repeatedly,” two separate lights are turned on at same or nearly same time, since that construction comports with ordinary meaning of “activating” derived from technical dictionary, and since there is nothing in record to suggest that “activating” means anything other than what dictionary definition would suggest, namely, “starting the operation” or “turning on.”

[4] Patent construction — Claims — Defining terms (§125.1305)

Phrase “selectively controlling the durations of the time intervals of activation,” in claims of patents directed to devices for controlling color of pixels in light emitting diode display, is properly construed to mean controlling width of pulses during repetition periods, since ordinary meaning of words themselves supports conclusion that limitation requires control of pulse width, and since this construction is entirely consistent with intrinsic evidence.

[5] Patent construction — Claims — Means (§125.1307)

Function of means-plus-function claim must be derived from language of claim itself, since 35 U.S.C. §112 does not permit limitation of such claim by adopting function different from that explicitly recited in claim; in present case, federal district court erred to extent it failed to follow claim language in defining function of limitation in issue, and compounded its error by misidentifying corresponding structure in specification.

[6] Patent construction — Claims — Defining terms (§125.1305)

Terms “display areas” and “background area,” as used in claims of patents directed to devices for controlling color of pixels in light emitting diode display, are properly construed as describing areas that are distinct and not interchangeable, since ordinary meaning of these limitations does not indicate that areas are interchangeable, and since specification and prosecution history support construction that requires display and background areas to be mutually exclusive; although specification indicates that display area pixels may be illuminated in background color, background pixels may not be illuminated in display color.

[7] Patent construction — Claims — Broad or narrow (§125.1303)

Patent construction — Claims — Means (§125.1307)

Federal district court erred in construing “converter means” limitation in claim directed to device for controlling color of pixels in light emitting diode display, even though court correctly identified recited function, since court used testimony of plaintiff’s expert to broaden its view of corresponding structure beyond that disclosed in specification and prosecution history, and since expert testimony regarding meaning of claim is entitled to no weight if, as in present case, patent documents are unambiguous.

[8] Patent construction — Claims — In general (§125.1301)**JUDICIAL PRACTICE AND PROCEDURE****Procedure — Jury trials (§410.42)**

Federal district court's issuance of jury instructions containing claim construction errors constituted prejudicial legal error in patent infringement action, since record shows that defendant warned court concerning court's failure to properly construe claims, and that defendant proposed constructions of disputed claim limitations that would have corrected flawed constructions.

[9] Procedure — Evidence — In general (§410.3701)

Federal district court did not abuse its discretion by excluding witness testimony that patent infringement defendant sought to admit for purpose of showing that inventions of patents in suit were in public use more than one year prior to original application date, since corroboration is required of any witness whose testimony alone is asserted to invalidate patent, regardless of his or her level of interest in litigation, and court did not abuse its discretion in concluding that corroboration was insufficient in present case, and since witness could not establish particular date of prior public use, which is critical consideration for statutory bar, and court properly found such testimony unreliable and potentially confusing to jury.

[10] Procedure — Evidence — Expert testimony (§410.3703)

Federal district court did not abuse its discretion by admitting into evidence revised report of plaintiff's expert on patent damages, since evidence supports finding that expert was competent and qualified, in that expert owned and managed two patent licensing companies following his manufacturing work in field of inventions of patents in suit, and since defendant's complaints concerning content of report go to evidentiary weight of report, not its admissibility.

REMEDIES**[11] Monetary — Damages — Patents — In general (§510.0507.01)**

Patent marking statute, 35 U.S.C. §287(a), describes circumstances that effect forfeiture of damages, not when or under what circumstances damages may be recovered; recovery of damages is not limited if there is no failure to mark, that is, if proper patent notice appears on products, or there are no products to mark, and statute thus does not require patentee who does not produce patented device to give notice to infringer before damages can be recovered.

Particular Patents**Particular patents — Electrical — Light emitting diode displays**

4,845,481, Havel, continuously variable color display device, judgment of infringement reversed and remanded.

4,965,561, Havel, continuously variable color optical device, judgment of infringement reversed and remanded.

4,734,619, Havel, display device with variable color background, judgment of infringement reversed and remanded.

4,804,890, Havel, variable color complementary display device, judgment of infringement reversed and remanded.

Case History and Disposition

Appeal from the U.S. District Court for the Northern District of Texas, Stickney, J.

Action by Texas Digital Systems Inc. against Telegenix Inc. for patent infringement. Defendant appeals from jury verdict and entry of judgment that defendant literally infringed patents in suit, from award of reasonable royalty, enhanced damages, and pre- and post-judgment interest, and from issuance of permanent injunction. Affirmed in part, reversed in part, and remanded.

Attorneys:

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Gregory J. Lavorgna, Joseph R. DelMaster Jr., Robert E. Cannuscio, and Stephen B. Schott, of Drinker, Biddle & Reath, Philadelphia, Pa., for defendant-appellant.

Judge:

Before Michel, Schall, and Linn, circuit judges.

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Opinion Text

Opinion By:

Linn, J.

Telegenix, Inc. ("Telegenix") appeals from the final judgment of the United States District Court for the Northern District of Texas in favor of Texas Digital Systems, Inc. ("TDS"). Because the district court erroneously construed certain disputed claim limitations, but correctly construed other claim limitations, we affirm-in-part, reverse-in-part, and remand.

BACKGROUND

TDS is the current owner of the four patents at issue, U.S. Patent Nos. 4,845,481 ("481 patent"), 4,965,561 ("561 patent"), 4,734,619 ("619 patent"), and 4,804,890 ("890 patent"), each issued to Karel Havel. TDS obtained these patents from Havel in 1997.

The Havel patents are directed to methods and devices for controlling the color of pixels in a light

emitting diode ("LED") display. Each pixel includes at least two elements corresponding to different primary colors, e.g., one red element and one green element. Light signals from the two elements may be blended to produce a composite light signal of variable color. Figure 1 of the '481 patent, reproduced below, shows seven pixels arranged in a familiar seven-segment display pattern, each pixel having a red element (i.e., 2a-2g) and a green element (i.e., 3a-3g).

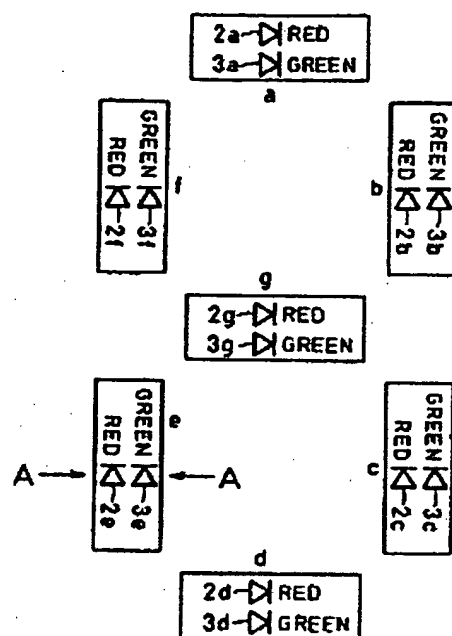


FIG. 1

Claims 1 and 2 of the '481 patent are representative of the asserted claims of the '481 and '561 patents:

1. A method for controlling a color of a variable color display device which comprises a plurality of *display areas arranged in a pattern* for selectively exhibiting a plurality of display units, each said display area including a plurality of light sources for emitting upon activation light signals of respectively different primary colors and means for combining said light signals to obtain a composite light signal of a composite color, by exhibiting a selected display unit by *repeatedly substantially simultaneously activating* the light sources in selected display areas for brief time intervals to cause the light sources to emit light signals of said primary colors, and by *selectively controlling the durations of the time intervals of activation* of the light sources in the selected display areas to control the portions of the primary color light signals emitted therefrom, to thereby control the color of the exhibited display unit. (emphases added)

2. A variable color display device comprising:

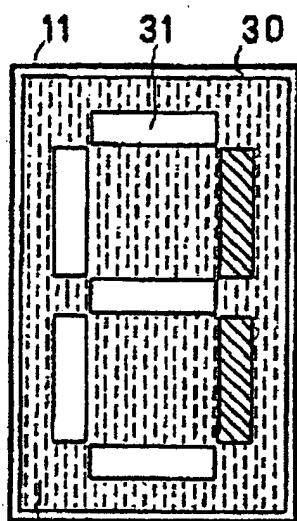
a plurality of variable color *display areas arranged in a pattern* for selectively exhibiting a plurality of display units, each said display area including a plurality of light sources or emitting upon activation light signals of respectively different primary colors and means for combining said light signals to obtain a composite light signal of a composite color;

means for exhibiting a selected display unit by *repeatedly substantially simultaneously activating* the light sources in selected display areas by pulses of a substantially constant amplitude for causing the light sources to emit light signals of said primary colors; and

color control means for selectively controlling the durations of the pulses applied to the light sources in the selected display areas to control the portions of the primary color light signals emitted therefrom, to thereby control the color of the exhibited display unit. (emphases added)

The '619 patent is directed to display devices including a variable color background

area 32 substantially surrounding the display area segments 31, as illustrated in Fig. 1a, reproduced below.



32 FIG. 1a

Claim 1 of the '619 patent is representative of the claims and is reproduced below:

1. A variable color display device comprising:

a plurality of variable color *display areas arranged in a pattern*, each said display area including a plurality of display light sources for emitting upon activation light signals of different colors and means for combining said light signals to obtain a composite light signal of a composite color;

a variable color background area substantially surrounding said display areas and including a plurality of background regions adjacent to said display areas, each said background region including a plurality of light sources for emitting upon activation light signals of different colors and means for combining said light signals to obtain a composite light signal of a composite color;

a plurality of opaque walls for optically separating said background regions from adjacent display areas; and

means for selectively activating said display light sources, to illuminate certain of said display areas in a first color, and said background light sources, to illuminate said background regions in a second color different from said first color. (emphases added)

The '890 patent is directed to a variable color LED display and display circuit as illustrated in Figure 3, reproduced below:

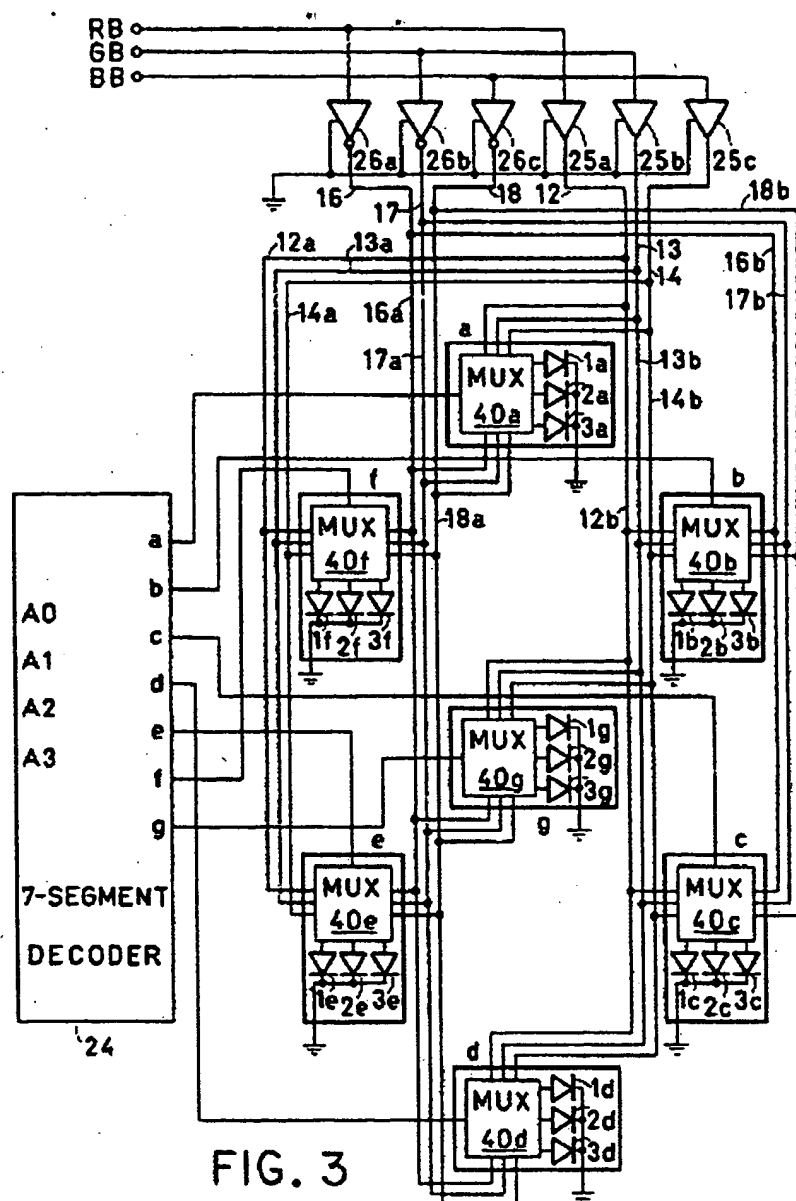


FIG. 3

Representative claim 4 of the '890 patent is reproduced below:

4. A display device comprising:

a plurality of variable color *display areas arranged in a pattern* for selectively exhibiting a plurality of display units, each said display area including a plurality of light sources for emitting upon activation light signals of different colors and means for

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combining said light signals to obtain a composite light signal of a composite color;

first means for carrying selective display color control signals;

converter means for converting said display color control signals to obtain complementary color control signals;

second means for carrying said complementary color control signals; and

control means for selectively coupling said light sources in said display areas to said first means, for causing selective ones of said display areas to illuminate in a selected color defined by said display color control signals, and to said second means, for causing the remaining display areas to illuminate in a

substantially complementary color defined by said complementary color control signals. (emphases added)

After TDS obtained the Havel patents in 1997, TDS filed suit, alleging that Telegenix's Colorgraphix devices infringed each of them. Following a jury verdict in favor of TDS, the district court entered judgment that Telegenix had literally infringed claims 1-4 and 7 of the '481 patent, claims 1-4 of the '561 patent, claim 1 of the '619 patent, and claim 4 of the '890 patent. The district court also found each of the asserted claims not invalid and concluded that Telegenix had willfully infringed "one or more" of the four asserted patents.

The district court awarded TDS a reasonable royalty of 20% as applied to \$30 million in infringing sales (i.e., \$6 million), enhanced damages of \$6 million, pre-judgment interest of \$3,007,999, post-judgment interest at 6.5%, and costs. The district court also permanently enjoined Telegenix from making, using, selling, or offering to sell its Colorgraphix color display devices, versions of its software used with the Colorgraphix color display devices, or other devices that otherwise infringe.

Telegenix appeals. We have jurisdiction pursuant to 28 U.S.C. §1295(a)(1).

ANALYSIS

Standard of Review

Claim construction is a question of law that this court reviews de novo. *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1456, 46 USPQ2d 1169, 1174 (Fed. Cir. 1998) (*en banc*). The standard of review for jury instructions is prejudicial legal error. See *Jamesbury Corp. v. Litton Indus. Prods.*, 756 F.2d 1556, 1558, 225 USPQ 253, 255 (Fed. Cir. 1985), *overruled on other grounds by A.C. Aukerman Co. v. R.L. Chaides Constr. Co.*, 960 F.2d 1020, 22 USPQ2d 1321 (Fed. Cir. 1992) (*en banc*). To prevail, the party challenging the jury instruction "must demonstrate both that the jury instructions actually given were fatally flawed and that the requested instruction was proper and could have corrected the flaw." *Biodex Corp. v. Loredan Biomedical, Inc.*, 946 F.2d 850, 862, 20 USPQ2d 1252, 1261 (Fed. Cir. 1991). "An erroneous instruction regarding claim interpretation that affects the jury's decision on infringement is grounds for a new trial." *Ecolab Inc. v. Paraclipse, Inc.*, 285 F.3d 1362, 1373, 62 USPQ2d 1349, 1356 (Fed. Cir. 2002).

Telegenix, which timely objected to the jury instructions at trial, argues that the district court erroneously interpreted the claims of the asserted patents in its *Markman* order and instructed the jury according to the erroneous claim constructions. Telegenix further argues that the district court abused its discretion in excluding certain evidence offered by Telegenix and in admitting other evidence presented by Texas Digital, and erroneously relied on the rule of *Wine Railway Appliance Co. v. Enterprise Railway Equipment Co.*, 297 U.S. 387 (1936). On these grounds, Telegenix seeks a new trial. We address each of the allegations of error in turn.

I. The Contours of Claim Construction

"In construing claims, the analytical focus must begin and remain centered on the language of the claims themselves, for it is that language that the patentee chose to use to 'particularly point[] out and distinctly claim[] the subject matter which the patentee regards as his invention.' 35 U.S.C. §112, ¶ 2." *Interactive Gift Express, Inc. v. Compuserve, Inc.*, 256 F.3d 1323, 1331, 59 USPQ2d 1401, 1406 (Fed. Cir. 2001). The terms used in the claims bear a "heavy presumption" that they mean what they say and have the ordinary meaning that would be attributed to those words by persons skilled in the relevant art. See *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366, 62 USPQ2d 1658, 1662 (Fed. Cir. 2002); *K-2*

Corp. v. Salomon S.A., 191 F.3d 1356, 1362-63, 52 USPQ2d 1001, 1004 (Fed. Cir. 1999); *Johnson Worldwide Assocs., Inc. v. Zebco Corp.*, 175 F.3d 985, 989, 50 USPQ2d 1607, 1610 (Fed. Cir. 1999); *Specialty Composites v. Cabot Corp.*, 845 F.2d 981, 986, 6 USPQ2d 1601, 1604 (Fed. Cir. 1988). Moreover, unless compelled otherwise, a court will give a claim term the full range of its ordinary meaning as understood by persons skilled in the relevant art. See *Rexnord Corp. v. Laitram Corp.*, 274 F.3d 1336, 1342, 60 USPQ2d 1851, 1854 (Fed. Cir. 2001); *Johnson Worldwide Assocs.*, 175 F.3d at 989, 50 USPQ2d at 1610; *Specialty Composites*, 845 F.2d at 986, 6 USPQ2d at 1604.

It has been long recognized in our precedent and in the precedent of our predecessor court, the Court of Customs and Patent Appeals, that dictionaries, encyclopedias and treatises are particularly useful resources to assist the court in determining the ordinary and customary meanings of claim terms. See *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1325, 63 USPQ2d 1374, 1380 (Fed. Cir. 2002) (“The ordinary meaning of a claim term may be determined by reviewing a variety of sources, including ... dictionaries and treatises . . .” (internal citations omitted)); *CCS Fitness*, 288 F.3d at 1366, 62 USPQ2d at 1662 (“[O]ur precedents show that dictionary definitions may establish a claim term’s ordinary meaning.”); *Optical Disk Corp. v. Del Mar Avionics*, 208 F.3d 1324, 1334-35, 54 USPQ2d 1289, 1295 (Fed. Cir. 2000) (“For such ordinary meaning, we turn to the dictionary definition of the term.”); *Quantum Corp. v. Rodime, PLC*, 65 F.3d 1577, 1581, 36 USPQ2d 1162, 1166 (Fed. Cir. 1995) (“[W]e see no error in the district court’s use of dictionary definitions to ascertain the ordinary meaning of the relevant claim limitation.”); *In re Ripper*, 171 F.2d 297, 299, 80 USPQ 96, 98 (C.C.P.A. 1948) (“[I]t is clear that in ascertaining the meaning of [the claim term] as it appears herein, reference properly may be made to the ordinary dictionaries.”).

Dictionaries are always available to the court to aid in the task of determining meanings that would have been attributed by those of skill in the relevant art to any disputed terms used by the inventor in the claims. See *Vitronics Corp. v. Conceptor, Inc.*, 90 F.3d 1576, 1584 n.6, 39 USPQ2d 1573, 1578 n.6 (Fed. Cir. 1996) (“[T]echnical treatises and dictionaries ... are worthy of special note. Judges are free to consult such resources at any time ... and may also rely on dictionary definitions when construing claim terms . . .”); *Cybor Corp.*, 138 F.3d at 1459, 46 USPQ2d at 1177 (citing *Vitronics* for the proposition that a court is free to consult dictionaries, encyclopedias, and treatises at any time to help determine the meaning of claim terms); *Vanguard Prods. Corp. v. Parker Hannifin Corp.*, 234 F.3d 1370, 1372, 57 USPQ2d 1087, 1089 (Fed. Cir. 2000) (“A dictionary is not prohibited extrinsic evidence, and is an available resource of claim construction.”).

[1] When a patent is granted, prosecution is concluded, the intrinsic record is fixed, and the public is placed on notice of its allowed claims. Dictionaries, encyclopedias and treatises, publicly available at the time the patent is issued, are objective resources that serve as reliable sources of information on the established meanings that would have been attributed to the terms of the claims by those of skill in the art. Such references are unbiased reflections of common understanding not influenced by expert testimony or events subsequent to the fixing of the intrinsic record by the grant of the patent, not colored by the motives of the parties, and not inspired by litigation. Indeed, these materials may be the most meaningful sources of information to aid judges in better understanding both the technology and the terminology used by those skilled in the art to describe the technology.

These materials serve as important resources to assist courts in many ways. For example, they are often used to aid in the interpretation of statutes and regulations and in the interpretation of terms used in contracts. See, e.g., *Rocknel Fastener, Inc. v. United States*, 267 F.3d 1354, 1356-57 (Fed. Cir. 2001) (advising that the interpretation of tariff terms, a matter of statutory construction, may be aided by reviewing “dictionaries, scientific authorities, and other reliable information sources” (citations omitted)); *Am. Express Co. v. United States*, 262 F.3d 1376, 1381 n.5 (Fed. Cir. 2001) (in interpreting Internal Revenue Service regulations and procedures, “[i]t is appropriate to consult dictionaries to discern the ordinary meaning of a term not explicitly defined by statute or regulation”); *Bowers v. Baystate Techs.*, No. 01-1108,

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LEXIS 17184, at *14-15 [64 USPQ2d 1065] (Fed. Cir. Aug. 20, 2002) (construing contract terms using non-technical and technical dictionaries); *Buchanan v. Dep't of Energy*, 247 F.3d 1333, 1339 (Fed. Cir. 2001) (relying on a dictionary definition in construing a settlement agreement). These materials deserve no less fealty in the context of claim construction.

As resources and references to inform and aid courts and judges in the understanding of technology and terminology, it is entirely proper for both trial and appellate judges to consult these materials at any stage of a litigation, regardless of whether they have been offered by a party in evidence or not. Thus, categorizing them as “extrinsic evidence” or even a “special form of extrinsic evidence” is misplaced and does not inform the analysis.

Because words often have multiple dictionary definitions, some having no relation to the claimed invention, the intrinsic record must always be consulted to identify which of the different possible dictionary meanings of the claim terms in issue is most consistent with the use of the words by the inventor. *See Dow Chem. Co. v. Sumitomo Chem. Co.*, 257 F.3d 1364, 1372-73, 59 USPQ2d 1609, 1614 (Fed. Cir. 2001); *Multiform Desiccants, Inc. v. Medzam, Ltd.*, 133 F.3d 1473, 1478, 45 USPQ2d 1429, 1433 (Fed. Cir. 1998). If more than one dictionary definition is consistent with the use of the words in the intrinsic record, the claim terms may be construed to encompass all such consistent meanings. *Rexnord*, 274 F.3d at 1343, 60 USPQ2d at 1858 (holding that the claim term “portion” may be interpreted in accordance with the dictionary definitions to encompass both “separate” and “integral” parts of an object). The objective and contemporaneous record provided by the intrinsic evidence is the most reliable guide to help the court determine which of the possible meanings of the terms in question was intended by the inventor to particularly point out and distinctly claim the invention. *See Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1250, 48 USPQ2d 1117, 1122 (Fed. Cir. 1998) (“The construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention will be, in the end, the correct construction.”).

Moreover, the intrinsic record also must be examined in every case to determine whether the presumption of ordinary and customary meaning is rebutted. *See id.* Indeed, the intrinsic record may show that the specification uses the words in a manner clearly inconsistent with the ordinary meaning reflected, for example, in a dictionary definition. In such a case, the inconsistent dictionary definition must be rejected. *See id.* (“[A] common meaning, such as one expressed in a relevant dictionary, that flies in the face of the patent disclosure is undeserving of fealty.”); *Liebscher v. Boothroyd*, 258 F.2d 948, 951, 119 USPQ 133, 135 (C.C.P.A. 1958) (“Indiscriminate reliance on definitions found in dictionaries can often produce absurd results.”). In short, the presumption in favor of a dictionary definition will be overcome where the patentee, acting as his or her own lexicographer, has clearly set forth an explicit definition of the term different from its ordinary meaning. *See In re Paulsen*, 30 F.3d 1475, 1480, 31 USPQ2d 1671, 1674 (Fed. Cir. 1994); *Intellicall, Inc. v. Phonometrics, Inc.*, 952 F.2d 1384, 1387-88, 21 USPQ2d 1383, 1386 (Fed. Cir. 1992). Further, the presumption also will be rebutted if the inventor has disavowed or disclaimed scope of coverage, by using words or expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope. *See Teleflex*, 299 F.3d at 1324, 63 USPQ2d at 1380.

[2] Consulting the written description and prosecution history as a threshold step in the claim construction process, before any effort is made to discern the ordinary and customary meanings attributed to the words themselves, invites a violation of our precedent counseling against importing limitations into the claims. *See, e.g., Generation II Orthotics Inc. v. Medical Technology Inc.*, 263 F.3d 1356, 1367,

59 USPQ2d 1919, 1928 (Fed. Cir. 2001) (“The district court should have construed the claim limitation ‘controlled’ according to its ordinary and accustomed meaning [citing medical dictionary], rather than importing a characteristic of a disclosed or preferred embodiment into that term.”); *Loctite Corp. v. Ultraseal Ltd.*, 781 F.2d 861, 867, 228 USPQ 90, 93 (Fed. Cir. 1985) (“Generally, particular limitations or embodiments appearing in the specification will not be read into the claims.”), *overruled on other grounds* by *Nobelpharma*

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AB v. Implant Innovations, Inc., 141 F.3d 1059, 46 USPQ2d 1097 (Fed. Cir. 1998). For example, if an invention is disclosed in the written description in only one exemplary form or in only one embodiment, the risk of starting with the intrinsic record is that the single form or embodiment so disclosed will be read to require that the claim terms be limited to that single form or embodiment. *See Teleflex*, 299 F.3d at 1328, 63 USPQ2d at 1383 (“To the extent that the district court construed the term ‘clip’ to be limited to the embodiment described in the specification, rather than relying on the language of the claims, we conclude that the district court construed the claim term ‘clip (28)’ too narrowly.”); *Comark Communications, Inc. v. Harris Corp.*, 156 F.3d 1182, 1186, 48 USPQ2d 1001, 1005 (Fed. Cir. 1998) (cautioning against the limitation of the claimed invention to preferred or specific embodiments or examples); *Transmatic, Inc. v. Gulton Indus., Inc.*, 53 F.3d 1270, 1277, 35 USPQ2d 1035, 1040-41 (Fed. Cir. 1995) (“[A] patent claim is not necessarily limited to a preferred embodiment disclosed in the patent.”); *SRI Int’l, Inc. v. Matsushita Elec. Corp.*, 775 F.2d 1107, 1121 n.14, 227 USPQ 577, 585 n.14 (Fed. Cir. 1985) (*en banc*) (“That a specification describes only one embodiment does not require that each claim be limited to that one embodiment.”). Indeed, one can easily be misled to believe that this is precisely what our precedent requires when it informs that disputed claim terms should be construed in light of the intrinsic record. *See, e.g., Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 980, 34 USPQ2d 1321, 1329-30 (Fed. Cir. 1995) (stating the claims must be construed in light of the specification and the patent’s prosecution history, if in evidence). But if the meaning of the words themselves would not have been understood to persons of skill in the art to be limited only to the examples or embodiments described in the specification, reading the words in such a confined way would mandate the wrong result and would violate our proscription of not reading limitations from the specification into the claims. *See, e.g., Teleflex*, 299 F.3d at 1328, 63 USPQ2d at 1383; *Generation II Orthotics*, 263 F.3d at 1367, 59 USPQ2d at 1928; *Comark*, 156 F.3d at 1186, 48 USPQ2d at 1005; *Transmatic*, 53 F.3d at 1277, 35 USPQ2d at 1040-41; *SRI Int’l*, 775 F.2d at 1121 n.14, 227 USPQ at 585 n.14.

By examining relevant dictionaries, encyclopedias and treatises to ascertain possible meanings that would have been attributed to the words of the claims by those skilled in the art, and by further utilizing the intrinsic record to select from those possible meanings the one or ones most consistent with the use of the words by the inventor, the full breadth of the limitations intended by the inventor will be more accurately determined and the improper importation of unintended limitations from the written description into the claims will be more easily avoided.

A. “repeatedly substantially simultaneously activating”

Each of the asserted claims of TDS’s ‘481 and ‘561 patents includes the limitation, “repeatedly substantially simultaneously activating.” ¹ The district court construed this limitation as follows:

The term *repeatedly* means “repeating” in its ordinary sense, and that the repetitions be fast enough such that the composite color is actually perceived by the viewer. The term *substantially, simultaneously activating* means that during some portion of this period (defined as *repeatedly*), the two separate lights are on at the same time. *Tex. Digital Sys. Inc. v. Telegenix, Inc.*, No. 3:98-CV-1537-R, slip op. at 11 (N.D. Tex. Dec. 6, 2000).

Telegenix argues that the district court erred by requiring merely that the lights *be on* simultaneously, instead of requiring that the activation of each light begin at substantially the same time. According to

Telegenix, the district court improperly separated the adverbs “substantially simultaneously” from the verb it modifies, “activating,” and thereby failed to require that the light emitting diodes (“LEDs”) must be activated, or turned on, at the same time.

According to TDS, the crucial word in the phrase is “repeatedly,” which would signal to one of skill in the art that the invention activates light sources repeatedly within the “refreshing

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period” or “repetition period” within which humans do not detect pulses due to the principle of “persistence of vision.” TDS argues that because one of skill in the art would understand that the claim refers to simultaneously activating light sources of different colors at some time during that critical repetition/refreshing period, and because humans cannot detect changes, pulses, or activations that occur within that period, the question of whether one begins activation of the LEDs at the exact same time or whether one simply ensures that both of the LEDs are on at some time during the repetition period is irrelevant. Thus, according to TDS, one of skill in the art would not interpret the claim term “repeatedly substantially simultaneously activating the light sources” to limit the starting point of the LED activations.

[3] The district court correctly construed the term “repeatedly.” However, the district court’s construction of the overall phrase “repeatedly substantially simultaneously activating” was in error and ignored the meaning of the term “activating.” We begin by ascertaining the ordinary meaning to one skilled in the art. *See Specialty Composites*, 845 F.2d at 986, 6 USPQ2d at 1604. According to a relevant technical dictionary, to activate is “[t]o start an operation, usually by application of an appropriate enabling signal.” *Modern Dictionary of Electronics* 20 (6th ed. 1984). We presume that the word used in a claim carries this ordinary meaning, but this presumption may be rebutted. *See CCS Fitness*, 288 F.3d at 1366, 62 USPQ2d at 1662. Here, the intrinsic evidence is entirely consistent with the dictionary definition, and there is nothing in the record to suggest that “activating” means other than what its dictionary definition would suggest, i.e., starting the operation or turning on. We conclude that the presumption has not been rebutted, and thus the ordinary meaning controls.

TDS has argued that “activating” can mean “being on.” Certainly, once activated, a lamp might accurately be described as “being on.” But the claim does not refer to the state of the lamps as being “substantially simultaneously activated.” The words used, which serve as the focus of the claim construction analysis, call for “substantially simultaneously activating” the lamps, and the ordinary meaning of that phrase requires that during some portion of the period defined as “repeatedly,” the two separate lights are turned on at the same or nearly the same time.

B. “selectively controlling the durations of the time intervals of activation”

Claims 1 and 3 of both the '481 and '561 patents include the limitation “selectively controlling the durations of time intervals of activation.” In its *Markman* ruling, the district court explicitly refused to provide a distinct definition for this limitation, deeming the phrase “sufficiently defined.”

Telegenix contended before the district court, and reiterates on appeal, that this limitation means “specifically controlling the length of time that individual pulses are activated to vary the amount of light emitted from a light source.” Telegenix argues that by his disclosure in the specification, the inventor limited the claims to varying color using pulse width modulation (“PWM”), a technique that varies the duration of individual pulses. Telegenix further contends that the inventor limited the asserted claims to PWM by statements and amendments during prosecution of the patents in suit.

TDS responds that the claims are not limited to the particular PWM technique suggested by Telegenix.

TDS urges that the claim language uses the plural form of both “durations” and “time intervals” and thus is consistent with an interpretation in which color is controlled with “more than one pulse and includes multiple activations of the same LED within the repetition period.” In other words, TDS urges a claim construction that would cover devices which change perceived light intensity by varying either the width of the pulses or the number of pulses.

The words of the claim require “controlling the durations” of the “time intervals of activation.” The plain meaning of “controlling the durations” indicates that the claimed invention requires variation of the duration of individual time intervals, or controlling the width of pulses, during which the LEDs are activated, e.g., PWM. This plain meaning is consistent with the specification of the '481 and '561 patents. The structures shown in Figures 9 and 11 of the '481 patent and Figure 1 of the '561 patent depict circuitry for driving the LEDs using PWM. As shown in Figure 9 of the '481 patent, the circuitry includes at

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least one counter 71f for each color connected to a corresponding memory 76 containing data regarding the amount of primary color activation required to produce the desired color. '481 patent, col. 4, ll. 24-59. The counter and corresponding memory are connected to a “flip-flop” 73 which provides the appropriate output to generate the desired color. *Id.* According to the specification, the “output of the flip flop 73 will be at a high logic level for a period of time proportional to the data” loaded into the counter 71f from the memory 76. *Id.* at col. 4, ll. 51-52. Thus, the circuitry controls color by setting the output “at a high logic level for a period of time proportional” to the desired color data.

Moreover, the prosecution history is consistent with this interpretation of the claim language. During prosecution of the '481 patent, the inventor distinguished prior art on the basis of PWM. The Patent Office initially rejected all claims in the application as obvious in view of the Kaelin reference, which taught that “LED color display elements can be varied by applying variable timed pulses to the individual diodes.” The applicant responded by submitting new claims and arguing that the invention “control[s] the durations of the pulses that are applied to the primary color light sources in the selected display areas to control the portions of the primary color light signals, to thereby control the color of the exhibited display unit.”

[4] On the basis of our review of the ordinary meaning of the words themselves, we conclude that this limitation requires control of pulse width. This is entirely consistent with the intrinsic record. Contrary to TDS’s argument, introducing multiple pulses of identical duration during the repetition period does not effect control of pulse duration. Where multiple pulses of identical duration are introduced during a single repetition period, pulse duration remains constant and color is controlled not by varying “the durations of the time intervals of activation” of pulses, as called for in the claims themselves, but by varying the number of constant duration pulses applied. Such a technique does not set the output “at a high logic level for a period of time proportional” to the desired color data nor does it “control the durations of the pulses,” and thus is inconsistent with the specification and prosecution history. We conclude that “selectively controlling the durations of the time intervals of activation” means controlling the width of pulses during repetition periods.

C. “color control means”

The “color control means” limitation appears in claims 2, 4, and 7 of the '481 patent, and claims 2 and 4 of the '561 patent. The limitation appearing in claim 2 of the '481 patent is representative:

color control means for selectively controlling the durations of the pulses applied to the light sources

in the selected display areas to control the portions of the primary color light signals emitted therefrom, to thereby control the color of the exhibited display unit. '481 patent, col. 9, ll. 59-64. The district court construed this limitation to be a means-plus-function limitation—a conclusion with which we agree. Neither party disputes that this limitation is subject to 35 U.S.C. §112, paragraph six. That paragraph states:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof. 35 U.S.C. §112, para. 6 (2000).

“Because this limitation is expressed in ‘means plus function’ language and because it does not recite definite structure in support of its function, it is subject to the requirements of 35 U.S.C. § 112, ¶ 6 (1994).” *B. Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1424, 43 USPQ2d 1896, 1899 (Fed. Cir. 1997). The first step in construing such a limitation is to identify the function of the means-plus-function limitation. *Micro Chem., Inc. v. Great Plains Chem. Co.*, 194 F.3d 1250, 1258, 52 USPQ2d 1258, 1263 (Fed. Cir. 1999). The next step is to identify the corresponding structure in the written description necessary to perform that function. *Id.* “Structure disclosed in the specification is ‘corresponding’ structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim.” *Braun*, 124 F.3d at 1424, 43 USPQ2d at 1900.

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The district court instructed the jury concerning the claimed function:

The color control means performs the function of selectively controlling the on times of the light sources to control the portions of primary color light signals for controlling the color of the composite light signal.

The district court described the corresponding structure from the specification as “the structure that performs as disclosed in the specification of the display decoder and decoder driver.”

[5] Telegenix argues that the district court erred by misidentifying both the claimed function and the corresponding structure from the specification. We agree. The function recited in the asserted claims does not include “selectively controlling the on times of the light sources.” Instead, the claim recites “selectively controlling the durations of the pulses applied to the light sources” To the extent that the district court failed to follow the claim language in defining the function, it erred. *See Micro Chem.*, 194 F.3d at 1258, 52 USPQ2d at 1263 (“The statute does not permit limitation of a means-plus-function claim by adopting a function different from that explicitly recited in the claim.”).

The district court further erred in its identification of “the display decoder and decoder driver” as the corresponding structure in the specification.

Section 112, ¶ 6, as is well-documented, was intended to permit use of means expressions without recitation of all the possible means that might be used in a claimed apparatus. ...The price that must be paid for use of that convenience is limitation of the claim to the means specified in the written description and equivalents thereof. *O.I. Corp. v. Tekmar Co.*, 115 F.3d 1576, 1583, 42 USPQ2d 1777, 1782 (Fed. Cir. 1997) (citations omitted). The duty to link or associate structure in the specification to the recited function is the quid pro quo for the convenience of employing § 112, paragraph 6. *Braun*, 124 F.3d at 1424, 43 USPQ2d at 1899. In the specification, the structure linked to the recited function of “selectively controlling the durations of the pulses applied to the light sources” includes the memory and counter circuitry illustrated in Figure 9. *See* '481 patent, col. 4, ll. 24-59. It was error for the district court to omit this structure from its claim construction of the color control means.

Accordingly, we conclude that the “color control means” performs the function of selectively controlling the durations of the pulses applied to the light sources to control the portions of the primary color light signals, to thereby control the color of the exhibited display unit. Moreover, we hold that the corresponding structure includes the memory 76, the counters 71e and 71f, the flip-flop 73, and associated connection circuitry illustrated in Figures 5 and 9. The color control means is limited to this corresponding structure and equivalents thereof.

D. “display areas” and “background area”

The patents in suit recite “display areas” and “background area” at several locations in the asserted claims. For example, claim 1 of the '619 patent recites “a plurality of variable color display areas ...; [and] a variable color background area . . .” The district court instructed the jury:

Display areas and the background areas “include any illuminated pixel anywhere on the display device with background pixels illuminated to substantially surround the illuminated display area pixels.” As the image for illuminated display area changes, so does the adjacent illuminated background area.”

Telegenix argues that the jury should have been instructed that the display areas are distinct from the background areas, that display areas cannot become background areas, and that background areas cannot become display areas. TDS argues that the claims encompass display areas arranged in the form of an array or matrix of areas, and as such the display areas and background areas are interchangeable.

[6] Beginning with the words of the claims themselves, the dictionary meaning of display is “[a] visually observable presentation of information . . .” *Illustrated Dictionary of Electronics* 147 (3rd ed. 1985). Background is defined as: “[the] context or supporting area of a picture . . .” *Id.* at 43. Thus, the ordinary meaning of “display area,” as reflected in these dictionary definitions, is an area designated to portray information. Background is ordinarily understood to provide the context or contrasting reference against which the displayed

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information is presented. The ordinary meaning of these limitations does not indicate that the display and background areas are interchangeable.

The specification of the '619 patent is consistent with an interpretation in which the display and background areas are distinct and not interchangeable. For example, the written description describes the invention as including “a variable color display area” and “a variable color background area 32, substantially surrounding the display area.” '619 patent, col. 2, ll. 16-21. The specifications of the patents in suit do not establish that display areas can *become* background areas, nor do they allow for their interchangeable use.

The specification of the '890 patent describes illuminating selected display areas in the background color to “blend with the background to provide maximum color contrast.” '890 patent, col. 2, ll. 41-54. However, this establishes only that the inventor contemplated that display areas could *function* similar to the background areas, not that the display and background areas could be interchangeable.

Looking to the prosecution history, there is additional evidence supporting a construction that the display and background areas are mutually exclusive. The inventor stated in response to a rejection: “[claims 1 and 2], similar to claim 13 which was not explicitly rejected, are distinguished from the prior art by the recitation of background regions separated from the display areas by opaque walls. No reference of the record describes explicitly defined background regions.” This evidence of manifest exclusion or restriction represents a clear disavowal of claim scope. *See Teleflex*, 199 F.3d at 1325, 63 USPQ2d at 1381. In doing so, the patentee expressly limited background areas to explicitly defined

regions. In addition, the patent examiner stated in his notice of allowance, “[t]he prior art does not show the combination of variable color display areas *and* a variable color background area; these being two discrete, distinct components of the device. It is this distinction which, as claimed, is deemed allowable over the prior art.”

The ordinary meaning of the words of the claims, coupled with the patentee’s statements in the specification and during prosecution, establish that the district court’s instruction was in error. Although the specification indicates that a display area can be illuminated in the background color to “blend with the background to provide maximum color contrast,” there is no corresponding indication that the background areas can be illuminated in the display color. The district court’s construction that background areas can include “any illuminated pixel anywhere on the display device” is incompatible with the patentee’s statements during prosecution expressly limiting the background areas to “explicitly defined background regions.”

Moreover, if the background and display areas could each include “any illuminated pixel,” the background area would not be different in nature or quality from the display area. Such a proposition is inconsistent with the language of the claims, in which the inventor claimed a device having two types of areas, and with the specification which describes distinct display areas and background areas.

On the basis of the ordinary meaning of the words of the claim and the intrinsic evidence, we conclude that these limitations should be construed as follows: display areas include any illuminated pixel anywhere on the display device, other than background area pixels in defined background regions. The background area pixels substantially surround the illuminated display area pixels. Display area pixels may be illuminated in the background color, but background area pixels may not be illuminated in the display color.

E. “display areas arranged in a pattern”

The limitation “display areas arranged in a pattern” appears in the asserted claims of the ‘481 and ‘619 patents, as well as claim 4 of the ‘890 patent. The district court construed “pattern” to mean “having a systematic arrangement.” Telegenix argues that this construction is too general, and the limitation should be limited to a seven-segment display pattern, for example, that shown in Figures 1ac of the ‘890 patent. TDS responds that this limitation is not limited to a seven-segment display or any other fixed pattern, and that the scope of the claims is broad enough to encompass a matrix display.

Where “pattern” is described in the specifications of the patents in suit, the seven-segment display is listed as an example of the preferred font. The ‘481 patent specification

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describes “seven elongated display segments a, b, c, d, e, f, g, arranged in a conventional pattern.” ‘481 patent, col. 2, ll. 24-25. The preferred embodiment of the ‘890 patent is described as including “a variable color display area consisting of seven segments 31 arranged in a well known 7-segment font.” ‘890 patent, col. 2, ll. 16-18. Nowhere in the specification is the limitation “display areas arranged in a pattern” restricted, explicitly or implicitly, to the seven-segment arrangement of the preferred embodiment.

Telegenix does not dispute that the patents in suit describe the seven-segment pattern in exemplary language. Instead, Telegenix argues that U.S. Patent No. 4,086,514 (“514 patent”) establishes that the same inventor represented matrix displays and seven-segment displays as two separate embodiments of the same invention. We fail to understand the relevance of Telegenix’s argument. Whether or not the claims in an unrelated patent are broad enough to encompass both a matrix and the familiar seven-

segment pattern, this proposition sheds no light on whether the claims of the patents in suit are limited to the seven-segment pattern. See *Abbott Labs. v. Dey, L.P.*, 287 F.3d 1097, 1104, 62 USPQ2d 1545, 1550 (Fed. Cir. 2002) (finding the relationship between two unrelated patents, although having common subject matter, a common inventor, and the same assignee, “insufficient to render particular arguments made during prosecution of [one of the patents] equally applicable to the claims of [the other patent]”).

Referring to the prosecution history, the Examiner's Statement of Reasons for Allowance for the '619 patent stated, "In this manner, multicolored arrays (i.e., color cathode ray tube displays such as Takeda, of record) in which there is no physical distinction between a foreground or background pixel (display area), are distinguished from by the claimed subject matter." Although the prosecution history may help define the scope of a term if relevant, *see Southwall Techs., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1576, 34 USPQ2d 1673, 1676 (Fed. Cir. 1995), this Examiner's statement has no bearing on the meaning of the term "pattern." Nor does this statement limit the scope of "pattern" to the familiar seven-segment font.

Accordingly, because there is nothing in the claims or the intrinsic evidence of record to indicate otherwise, we conclude that this limitation was correctly construed by the district court according to the ordinary meaning of “pattern.” The district court’s construction, “having a systematic arrangement,” is not in error.

F. “means for selectively activating said display light sources”

The limitation “means for selectively activating said display light sources” appears in claim 1 of the '619 patent. The district court instructed the jury:

The function of this means-plus function element is to control the activation of light sources to illuminate the display area in a first color and the background area in a second color, different from the display area's first color. The function is to activate the display area by passing current through selected light sources of the display area and the background area. The structural components are specified in Figures 3 and 4.

Telegenix argues that the court's construction is too broad, and misled the jury to believe that this limitation can be met by any structure broadly suggested by Figure 3, which shows only a block diagram. Telegenix requested an instruction limiting the structure to the circuitry shown in Figure 4. Telegenix also argues that "passing current through selected light sources" incorrectly identifies the function.

TDS argues that its expert testified that “means for selectively activating” includes hardware, software, and/or firmware for passing current through selected light sources, as supported by Figures 3 and 4. TDS argues that a block diagram such as that shown in Figure 3 may describe structure.

TDS argues in favor of a broad interpretation of this claim limitation in reliance on the testimony of its expert. “[E]xtrinsic evidence in general, and expert testimony in particular, may be used only to help the court come to the proper understanding of the claims; it may not be used to vary or contradict the claim language.” *Vitronics*, 90 F.3d at 1584, 39 USPQ2d at 1578. Where the patent documents are unambiguous, expert testimony regarding the meaning of a claim is entitled to no

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weight. *Id.* “Any other rule would be unfair to competitors who must be able to rely on the patent documents themselves, without consideration of expert opinion that then does not even exist, in ascertaining the scope of a patentee’s right to exclude.” *Id.* (quoting *Southwall Techs.*, 54 F.3d at 1578, 34 USPQ2d at 1678-79). Thus, where the patent documents are unambiguous, reliance upon the testimony of TDS’s expert witness would be improper.

We hold, and the parties do not dispute, that this limitation is in means-plus-function form and thus is subject to 35 U.S.C. §112, paragraph six. As stated above, in construing such a limitation, the task of the district court is first to identify the function recited for the limitation and next to identify the corresponding structure in the written description necessary to perform that function. *See Micro Chem.*, 194 F.3d at 1258, 52 USPQ2d at 1263.

The district court misidentified the recited function by including in the construction, “The function is to activate the display area by passing current through selected light sources of the display area and the background area.” This reference to “passing current” has no basis in the claim language. *See Generation II Orthotics*, 263 F.3d at 1364-65, 59 USPQ2d at 1926 (“When construing the functional statement in a means-plus-function limitation, we must take great care not to impermissibly limit the function by adopting a function different from that explicitly recited in the claim.”); *Micro Chem.*, 194 F.3d at 1258, 52 USPQ2d at 1263 (“The statute does not permit limitation of a means-plus-function claim by adopting a function different from that explicitly recited in the claim.”).

Likewise, the district court's identification of the corresponding structure was incomplete. The description in the specification of the structure corresponding to the recited function is not limited to Figures 3 and 4, as instructed, but also includes the written description accompanying these Figures. *See* '619 patent, col. 3, ll. 34-68, and col. 4, ll. 1-61. Moreover, as Figure 3 and its accompanying text serve merely as overview for introducing and explaining Figure 4, the corresponding structures must necessarily be found in Figure 4.

We conclude that the “means for selectively activating” performs the function of “illuminat[ing] certain of said display areas in a first color, and said background light sources, to illuminate said background regions in a second color different from said first color.” The corresponding structure in the specification is described in Figure 4 and the accompanying written description, including the overview provided by Figure 3 and the written description accompanying that Figure. The “means for selectively activating” is limited to this corresponding structure and equivalents thereof.

G. “converter means”

The phrase “converter means” is a limitation recited in claim 4 of the '890 patent. The district court interpreted this phrase to mean:

The converter means includes firmware, software and/or hardware that functions to convert said display color control signals to obtain complementary color control signals.

Telegenix argues that this interpretation is unsupported, because no software or firmware is mentioned anywhere in the specification. Telegenix argues that the structure disclosed for the “converter means” is the multiplexer and inverter arrangement described in the written description and figures.

TDS argues that its expert testified that one of ordinary skill in the art would have appreciated that the converter means could be implemented in hardware, software, and/or firmware. TDS argues that the function of the converter means includes providing a complementary color in response to the selected display area color, and the multiplexer does not perform this function. Instead, according to TDS, only the inverter performs this function.

There is no dispute that “converter means” is a means-plus-function limitation within the meaning of section 112, paragraph 6. Again, in construing such a limitation, the task of the district court is to first identify the function recited for the limitation, and next to identify the corresponding structure in the written description necessary to perform that function. *See Micro Chem.*, 194 F.3d at 1258, 52 USPQ2d at 1263.

[7] In its construction of the “converter means,” the district court failed to identify the corresponding structure from the specification. The district court correctly performed the first step by identifying the claimed function, “to convert said display control color signals

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to obtain complementary color control signals.” However, the court’s description of the corresponding structure as “includ[ing] firmware, software and/or hardware” has no basis in the specification. TDS essentially admits in its brief that the testimony of TDS’s expert was used to broaden the court’s view of the corresponding structure beyond that disclosed in the specification and prosecution history.

TDS argues that the structure identified by the district court could qualify as equivalent structure under section 112, paragraph six. This argument misunderstands the deficiency in the district court's construction. Even if software and firmware could be equivalent structures under section 112, paragraph six, the court failed to correctly perform the second step of identifying the structure disclosed in the written description as corresponding to the recited function. Instead, the court identified a broad array of possible structures not mentioned anywhere in the specification.

We conclude that the district court erred in construing this limitation. Where the patent documents are unambiguous, expert testimony regarding the meaning of a claim is entitled to no weight. *Vitronics*, 90 F.3d at 1584, 39 USPQ2d at 1578. The “converter means” performs the function of converting the display color control signals to obtain complementary color control signals. The corresponding structure includes inverters 26a-c depicted in Fig. 3 and described in the specification at col. 3, ll. 31-39, and col. 4, ll. 8-27. The “converter means” is limited to this corresponding structure and equivalents thereof.

H. "first means" and "second means" for carrying color control signals

The “first means” and “second means” are limitations recited in claim 4 of the '890 patent. The district court instructed the jury:

The first means for carrying includes functions that are performed by electrical paths which are non-inverting buses for the red and green LEDs shown in Figure 3 and described in Column 3, lines 23-30. First means includes “firmware, software and/or hardware that function to carry the information which determines the display area (character) color.”

The court further instructed:

The second means for carrying includes functions that are performed by electrical paths which are inverting buses for the red and green LEDs shown in Figure 3 and described in column 3, lines 31-35. Second means for carrying includes “any firmware, software and/or hardware that function to carry complementary control signals.”

Telegenix repeats its arguments that the specification does not disclose “firmware, software, and/or hardware” that performs the claimed functions. Telegenix argues that the structure should be limited to inverting and non-inverting electrical buses.

TDS argues that Figure 2 shows structure for carrying the color control signals in the form of signal lines connecting the Display Color Control block 21 and the Complement Color Control block 22 with the Variable Color Display block 11.

Again, the parties do not dispute that the “first means” and “second means” are in means-plus-function form and thus are subject to 35 U.S.C. §112, paragraph six.

The district court misidentified both the recited function and the corresponding structure with respect to “first means” and “second means.” Instead of identifying the function recited for the first means, the district court’s instruction to the jury indicated that the function was “to carry the information which determines the display area (character) color.” We disagree. This language appears nowhere in claim 4, and unnecessarily limits the function actually recited in claim 4, “carrying selective display color control signals.” See *Generation II Orthotics*, 263 F.3d at 1364-65, 59 USPQ2d at 1926 (“When construing the functional statement in a means-plus-function limitation, we must take great care not to impermissibly limit the function by adopting a function different from that explicitly recited in the claim.”). Likewise, the district court erred in identifying the recited function of the second means. The recited function is “for carrying said complementary color control signals.”

Concerning the district court’s identification of corresponding structure, it is undisputed that such structure includes the non-inverting buses described in the specification. However, the district court ventures beyond the specification to include in its construction “any firmware, software and/or hardware” that performs the identified function. Committing the same error as with the “converter means,” the district court relied on expert testimony to

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broaden its interpretation of the corresponding structure beyond that appearing in the specification.

Although TDS argues that Figure 2 identifies structure broader than the inverting and non-inverting buses described in the written description, Figure 2 fails to describe any structure for the first and second means sufficient to comport with section 112, paragraph six. If a patentee fails to disclose an adequate corresponding structure in the specification, the patentee may fail to satisfy the bargain embodied in the statutory quid pro quo of section 112, paragraph six. See *Kemco Sales, Inc. v. Control Papers Co.*, 208 F.3d 1352, 1360, 54 USPQ2d 1308, 1313 (Fed. Cir. 2000). Notwithstanding its adequacy, Figure 2 provides no support whatsoever for the district court’s identification of the corresponding structure as including “any firmware, software and/or hardware.”

We conclude that the district court’s claim construction for “first means” and “second means” was flawed to the extent that it misidentified the functions recited in claim 4 of the '890 patent and included in the corresponding structure “any firmware, software and/or hardware.” See *Vitronics*, 90 F.3d at 1585, 39 USPQ2d at 1579 (“Because the specification clearly and unambiguously defined the disputed term in the claim, reliance on this extrinsic evidence was unnecessary and, hence, legally incorrect.”). The recited function of the first means is “carrying selective display color control signals,” and the corresponding structure includes “electrical paths which are non-inverting buses for the red and green LEDs shown in Figure 3 and described in Column 3, lines 23-30.” The recited function of the second means is “carrying said complementary color control signals,” and the corresponding structure includes “electrical paths which are inverting buses for the red and green LEDs shown in Figure 3 and described in column 3, lines 31-35.” The first means and second means are limited to the identified corresponding structure and equivalents thereof.

I. “control means for selectively coupling said light sources”

The “control means for selectively coupling” appears in claim 4 of the '890 patent. Claim 4 of the '890 patent recites:

control means for selectively coupling said light sources in said display areas to said first means, for causing selective ones of said display areas to illuminate in a selected color defined by said display color control signals, and to said second means, for causing the remaining display areas to illuminate in a substantially complementary color defined by said complementary color control signals. '890

patent, col. 10, ll. 16-23.

The district court's instruction to the jury construing "control means" was:

Control means includes any firmware, software, and/or hardware that functions to selectively couple the light sources in the display areas to said first means for carrying thereby causing the selective ones of the display areas to illuminate in a selected color Control means is defined as a multiplexer. Multiplexers serve to selectively couple each display area of a display device to non-inverting and inverting buses in order to illuminate the display areas with either the desired color or a substantially complimentary color in accordance with the output of the decoder. The decoder output is respectively coupled to the display areas. The multiplexer simultaneously couples the display areas to the display control bus and couples the converted display signal to the background areas of the display device.

Telegenix argues that inclusion of "any firmware, software, and/or hardware" was error. Telegenix argues that the Statement of Reasons for Allowance in the prosecution history of the '890 patent shows that the inventor limited the claims to require a hardware multiplexer, thus firmware or software multiplexers would be excluded.

TDS concedes that the "control means" must include a multiplexer, but TDS contends that the circuit shown in Figure 4 of the '890 patent is not the only implementation of a multiplexer, again citing expert testimony in support.

The limitation "control means" is in means plus function form, and neither party disputes the district court's identification of the recited function, which we conclude is correct.

However, for the same reasons announced earlier with regard to the "converter means," the district court erred by including "any firmware, software, and/or hardware" in its

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identification of the corresponding structure. *See Vitronics*, 90 F.3d at 1585, 39 USPQ2d at 1579 ("Because the specification clearly and unambiguously defined the disputed term in the claim, reliance on this extrinsic evidence was unnecessary and, hence, legally incorrect."). We can find no support in the specification or prosecution history for such a broad array of structures. Instead, the specification describes a hardware multiplexer at col. 5, ll. 45-68 and col. 6, ll. 1-20, illustrated in Figures 3 and 4. We conclude that the correct construction of "control means" is that of the district court with the phrase "includes any firmware, software, and/or hardware that" excised from the first sentence and the phrase "a multiplexer" at the end of the second sentence replaced with the phrase — the multiplexer shown in Figure 4 and described in the accompanying written description, and equivalents thereof—.

II. Prejudicial Error

Telegenix has shown that the district court erred in construing limitations of the claims, but this alone is not enough to challenge jury instructions with respect thereto—the standard of review for jury instructions is prejudicial legal error. *See Jamesbury*, 756 F.2d at 1558, 225 USPQ at 255. Thus, to prevail, the party challenging a jury instruction "must demonstrate both that the jury instructions actually given were fatally flawed and that the requested instruction was proper and could have corrected the flaw." *Biodex*, 946 F.2d at 862, 20 USPQ2d at 1261; *accord Ecolab*, 285 F.3d at 1372-73, 62 USPQ2d at 1356-1357.

[8] Although TDS argues that Telegenix has failed to demonstrate prejudice from these claim construction errors, Telegenix correctly points to the record, which shows that Telegenix warned the district court concerning the court's failure to properly construe the means-plus-function limitations and

proposed constructions of the disputed claim limitations that would have corrected the flaws. On this record, we conclude that the claim construction errors committed by the district court were prejudicial. Accordingly, we vacate the decision of the district court and remand for a new trial of both liability and damages. To assist the district court on remand, we address the allegations of error regarding the admissibility of the challenged testimony of Brent W. Brown (“Brown”) and J. Carl Cooper (“Cooper”), and the district court’s reliance on the Supreme Court’s decision in *Wine Railway Appliance Co. v. Enterprise Railway Equipment Co.*, 297 U.S. 387 (1936).

III. Admissibility of Evidence

We review a trial court's decision to exclude evidence for abuse of discretion. *Beech Aircraft Corp. v. Rainey*, 488 U.S. 153, 172 (1988). To be admissible, expert testimony must "assist the trier of fact to understand the evidence or to determine a fact in issue." Fed. R. Evid. 702; *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 147 [50 USPQ2d 1177] (1999).

Telegenix argues that the district court abused its discretion by excluding the evidence offered by Brown, and by admitting the testimony of Cooper respecting damages. We first address Telegenix's argument with respect to Brown and then with respect to Cooper.

A. Brown

Telegenix argues that the district court erroneously excluded the testimony of Brown, an engineer who developed a variable color LED display in the early 1980's. Telegenix argues that Brown's testimony, along with his 1982 patent application, would have shown that the patents in suit were in public use prior to one year before the original application in 1986.

The district court refused to admit Brown's testimony, stating:

He testified that he had a prototype of a multicolor display unit somewhere prior to 1985. I think he testified '83 or so, somewhere around there, but he didn't testify that it was out in the public anywhere or that any were sold prior to 1986. He just couldn't remember. That's the type of unreliable evidence that is difficult to make a determination whether or not to admit to a jury.

The district court also stated:

It's too dangerous to submit this evidence to the jury based upon the testimony of Mr. Brown and their offer of proof because Mr. Brown is just uncertain of the facts and circumstances surrounding when the invention actually got out into the public. ... The Court finds that the uncorroborated testimony

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of Mr. Brown would be confusing to the jury . . .

[9] Telegenix argues that the district court erred by excluding Mr. Brown's testimony as lacking in sufficient corroboration. Telegenix contends that because his evidence was not offered as a party seeking to prove priority, no corroboration is required. Telegenix's argument misreads our caselaw on corroboration. "[C]orroboration is required of any witness whose testimony alone is asserted to invalidate a patent, regardless of his or her level of interest." *Finnigan Corp. v. Int'l Trade Comm'n*, 180 F.3d 1354, 1369, 51 USPQ2d 1001, 1012 (Fed. Cir. 1999). Thus, the district court correctly required corroboration for Brown's testimony.

Telegenix argues that, even if Brown's testimony required corroboration, his 1982 patent application and other documentary and physical evidence provided sufficient corroboration for his testimony.

Telegenix argues that the court erred by excluding the 1982 unissued patent application as corroborating evidence, citing *Sandt Technology v. Rescoe*, 264 F.3d 1344, 1351, 60 USPQ2d 1091, 1094 (Fed. Cir. 2001).

We assess corroboration according to the factors enumerated in *Woodland Trust v. Flowertree Nursery, Inc.*:

(1) the relationship between the corroborating witness and the alleged prior user, (2) the time period between the event and trial, (3) the interest of the corroborating witness in the subject matter in suit, (4) contradiction or impeachment of the witness' testimony, (5) the extent and details of the corroborating testimony, (6) the witness' familiarity with the subject matter of the patented invention and the prior use, (7) probability that a prior use could occur considering the state of the art at the time, and (8) impact of the invention on the industry, and the commercial value of its practice. 148 F.3d 1368, 1371, 47 USPQ2d 1363, 1366 (Fed. Cir. 1998). "Documentary or physical evidence that is made contemporaneously with the inventive process provides the most reliable proof that the inventor's testimony has been corroborated." *Sandt*, 264 F.3d at 1350-51, 60 USPQ2d at 1094.

Despite Telegenix's argument, the district court did not refuse to consider Brown's 1982 unissued patent application, but instead expressly considered it for corroboration purposes. Judge Stickney stated in open court, "Now, Mr. Brown's testimony is not corroborated other than by his patent application, which the Court finds is insufficient corroboration."

However, the district court did refuse to consider Brown's '114 patent and physical evidence for corroboration purposes because it was not prior or contemporaneous evidence, as Telegenix concedes. TDS argues that the physical evidence offered with Brown's testimony was properly excluded because it was built after the effective date of the patents in suit. Whether or not the district court erred in refusing to consider this evidence for corroboration purposes, Telegenix faces a particularly high hurdle in attempting to demonstrate abuse of discretion in light of the stringent standard for corroboration. *See Juicy Whip, Inc. v. Orange Bang, Inc.*, 292 F.3d 728, 741-43, 63 USPQ2d 1251, 1260-61 (Fed. Cir. 2002). In the absence of further contemporaneous corroborating evidence, we are unable to conclude that the district court abused its discretion in refusing to admit Brown's testimony for lack of corroboration.

The district court excluded Brown's testimony for the further reason that Brown gave uncertain testimony concerning the date of public use: "Mr. Brown is just uncertain of the facts and circumstances surrounding when the invention actually got out into the public ... he just really doesn't remember anything." The district court cited Federal Rule of Evidence 403 ("FRE") and found that Brown's testimony would be confusing to the jury.

Although the record before us indicates that Brown gave clear and definite testimony concerning certain facts related to public use, it is also clear that Brown could not recall the details:

Q: You said you sold the company — did you sell multicolor displays using red and green LEDs prior to your sale of ISE to Bray in 1983?

A: I can't honestly remember at that point.

Q: Did Bray sell those devices after you sold the company to Bray and moved over to that company?

A: Yes. That was a product line that we continued to develop and was being sold

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when I bought the company back in 1986, in December.

Q: They were sold prior to 1986?

A: Yes.

Q: For approximately how long?

A: I can't tie it down exactly because the —it was an ongoing development, and I was running both companies, the whole division. So I can't tie it any closer than that.

The district court ultimately excluded the evidence because Brown could not establish a particular date of public use, a critical consideration for a statutory bar. The court found Brown's testimony unreliable and potentially confusing to the jury, and rightfully excluded it pursuant to FRE 403. On the basis of the record before us, we cannot conclude that the district court abused its discretion.

B. Cooper

Telegenix argues that the district court improperly admitted Cooper's revised expert report on patent damages. Telegenix contends that Cooper is unqualified to testify as an expert in this subject. Telegenix argues that Cooper's report contained numerous flaws, including that Cooper's profit calculations for Telegenix products were not based on the actual cost figures provided by Telegenix; that Cooper did not take into account that hypothetical licensing negotiations taking place in 1992 would have been with the inventor Mr. Havel, not with TDS; that Cooper did not account for revenues and profits from related products; and that Cooper's premise that TDS did not license its patents was false because the evidence showed that another company took two licenses.

[10] Despite Telegenix's qualifications argument, the evidence supports a finding that Cooper was competent and qualified. Cooper owned and managed two patent licensing companies following his work in manufacturing displays in the early 1990's.

The district court initially refused to admit Cooper's second damages report because Cooper had revised the cost figures provided by Telegenix. The court ruled that Cooper must use the actual cost figures provided by Telegenix, and permitted Cooper to submit another report with the corrected figures. Although Telegenix argues that it did not receive the revised report until shortly before trial, due to the nature of the revisions Telegenix can hardly claim unfair surprise.

Telegenix's other complaints allege no abuse of discretion by the district court. Instead, Telegenix takes issue with the content of Cooper's opinion. As the district court stated, Telegenix's complaints go to weight, not admissibility. We conclude that the district court did not abuse its discretion by admitting Cooper's corrected expert report.

IV. Wine Railway

Telegenix argues that the district court erroneously relied on *Wine Railway Appliance Co. v. Enterprise Railway Equipment Co.*, 297 U.S. 387 (1936), in sustaining the jury's award of damages for acts of infringement dating back to 1992. Telegenix argues that it did not receive notice that it was infringing the patents in suit until 1998, and, by permitting liability for acts prior to 1998, the rule of *Wine Railway* undermines the notice requirement of 35 U.S.C. § 287.

TDS argues that the damages awarded by the jury were not limited by section 287 because TDS did not trigger operation of the statute. TDS contends that it could not have triggered operation of the statute because it did not produce or sell the patented product—there was no “failure so to mark” under 35 U.S.C. § 287(a). TDS argues that *Wine Railway* is still good law on which the district court properly relied.

[11] The Supreme Court in *Wine Railway* held that the patent marking statute then in effect did not require a patentee who did not produce the patented device to give actual notice to an infringer before damages could be recovered. Although *Wine Railway* interpreted a predecessor to the current patent marking statute, we have applied *Wine Railway* to the modern statutory counterpart, 35 U.S.C. § 287. See *Nike, Inc. v. Wal-Mart Stores, Inc.*, 138 F.3d 1437, 1443, 46 USPQ2d 1001, 1008 (Fed. Cir. 1998); *Am. Med. Sys., Inc. v.*

Med. Eng'g Corp., 6 F.3d 1523, 1538, 28 USPQ2d 1321, 1332 (Fed. Cir. 1993); *Bandag, Inc. v. Gerrard Tire Co.*, 704 F.2d 1578, 1581, 217 USPQ 977, 979 (Fed. Cir. 1983).

Telegenix's arguments reveal a misunderstanding of the patent marking statute. The statute does not specify when or under what circumstances damages may be recovered.

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Rather, it describes circumstances that effect a forfeiture of damages:

In the event of failure so to mark, no damages shall be recovered by the patentee in any action for infringement, except on proof that the infringer was notified of the infringement and continued to infringe thereafter, in which event damages may be recovered only for infringement occurring after such notice. 35 U.S.C. §287(a) (2000). Thus, section 287 "penalizes the use of unauthorized marks upon manufactured articles" and limits the extent to which damages may be recovered where products covered by a U.S. patent are sold without the notice defined in the statute. *Wine Railway*, 297 U.S. at 393. The recovery of damages is not limited where there is no failure to mark, i.e., where the proper patent notice appears on products or where there are no products to mark. *Id.* As the Supreme Court so aptly stated:

The idea of a tangible article proclaiming its own character runs through this and related provisions. Two kinds of notice are specified—one to the public by a visible mark, another by actual advice to the infringer. The second becomes necessary only when the first has not been given; and the first can only be given in connection with some fabricated article. Penalty for failure implies opportunity to perform. *Id.* at 395. The district court did not err in its reliance on the rule of *Wine Railway*.

CONCLUSION

For the foregoing reasons, the decision of the district court is affirmed-in-part, reversed-in-part, and remanded.

AFFIRMED-IN-PART, REVERSED-IN-PART, and REMANDED

COSTS

No costs.

Footnotes

¹ Although certain claims of the patents in suit include a slight modification of this phrase, the parties have treated the modified phrases in an identical manner for purposes of this appeal.

- End of Case -

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